GeneAmp® PCR System 2700

For Amplification of Nucleic Acids

User Guide

Applied Biosystems

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Contents

1 Introduction and Safety

Overview 1-1
About This Manual 1-2
Instrument Safety 1-3
Electrical Requirements 1-7
Laboratory Environmental Requirements 1-9
Chemical Safety 1-10

2 System Overview

Overview 2-1
Introducing the GeneAmp PCR System 2700 2-2
About the Control Panel 2-4
Overview of Functions 2-5
Introducing an Important Screen 2-6

3 Getting Started

Overview 3-1
Powering On 3-2
Adding Yourself as a User 3-3
Creating a Method 3-5
Editing Your Method 3-7
Starting and Stopping a Run 3-8
More Features 3-10

4 Runs

Overview 4-1
Using Disposables 4-2
Loading Samples 4-5
Starting a Run 4-7
Pausing or Stopping a Run 4-9
Reviewing the History of a Run 4-11
When a Run Completes 4-13

5 Methods and Users

Overview 5-1
Adding, Changing, or Deleting a User Name 5-2
Creating a Method 5-6
Changing a Method Using Advanced Features 5-9
Handling Methods 5-18

6 Utilities

Overview 6-1
Configuring the Instrument 6-2
Upgrading System Firmware 6-4
Connecting to a Printer 6-5
Calculating the Melting Temperature 6-6
Running Hardware Diagnostics 6-7
Running the Calibration Verification Test 6-9
Running the Temperature Non-Uniformity Test 6-9
Running System Performance Diagnostics 6-10

7 Maintenance

Overview 7-1
Cleaning the Instrument 7-2
Replacing Fuses 7-4

8 Troubleshooting

Overview 8-1
If There's a Power Failure 8-2
Display Screen Error Messages 8-3
Troubleshooting Information 8-6

A Getting Help

Overview A-1
Technical Support A-2

B Specifications

Overview B-1
System Specifications B-2
Control Panel Specifications B-2
Sample Temperature Information B-3
Printer Specifications B-3

C Supplied Methods

Overview C-1
About the Methods C-2

D Screen Flowcharts

Overview D-1
Run D-2
Stop or End of Run D-3
Create/Edit D-4
User. D-5
Utilities D-6
Diagnostics D-7
Upgrade D-8

Index

Introduction and Safety 1

Overview

About This Chapter This chapter provides information to help you safely operate the GeneAmp® PCR System 2700.

In This Chapter Topics in this chapter include the following:

Topics	See Page
About This Manual	1-2
Instrument Safety	1-3
Electrical Requirements	1-7
Laboratory Environmental Requirements	1-9
Chemical Safety	1-10

About This Manual

Overview

This manual describes how to use the GeneAmp PCR System 2700. It includes the following chapters and appendixes:

- Chapter 1, “Introduction and Safety,” contains safety information.
- Chapter 2, “System Overview,” provides an introductory overview of the instrument.
- Chapter 3, “Getting Started,” is a tutorial.
- Chapter 4, “Runs,” describes how to use disposables, load samples, and start and stop a run.
- Chapter 5, “Methods and Users,” tells how to create and edit a method and how to add a user.
- Chapter 6, “Utilities,” describes how to configure the instrument and perform diagnostic tests.
- Chapter 7, “Maintenance,” provides procedures for cleaning the sample block and replacing fuses.
- Chapter 8, “Troubleshooting,”lists error messages and other problems and gives ways to resolve them.
- Appendix A, “Getting Help,” describes how to get technical support.
- Appendix B, “Specifications,” contains instrument specifications.
- Appendix C, “Supplied Methods,” describes precoded methods provided in the system software.
- Appendix D, “Screen Flowcharts,” contains flowcharts showing various screen paths from the Main Menu.

Instrument Safety

Safe Operation

Before operating the instrument, read the information in this section concerning hazards and potential hazards. Ensure that anyone involved with the operation of the instrument is instructed in both general safety practices for laboratories and specific safety practices for the instrument.

Safety Alert Symbols

The following chart is an illustrated glossary of all electrical symbols that are used on Applied Biosystems instruments. Whenever such symbols appear on instruments, please observe appropriate safety procedures.

Electrical Symbols

	This symbol indicates the On position of the main power switch.
	This symbol indicates the Off position of the main power switch.
	This symbol indicates the On/Off position of a push-push main power switch.
	This symbol indicates that a terminal may be connected to another instrument's signal ground reference. This is not a protected ground terminal.
	This symbol indicates that this is a protective grounding terminal that must be connected to earth ground before any other electrical connections are made to the instrument.
	A terminal marked with this symbol either receives or delivers alternating current or voltage.
	A terminal marked with this symbol can receive or supply an alternating and a direct current or voltage.
	This symbol indicates the presence of high voltage and warns the user to proceed with caution.
	This symbol alerts you to consult the manual for further information and to proceed with caution.

Electrical Safety Testing

Routine safety testing of analytical instruments (*e.g.*, high potential voltage testing) may be required by various safety agencies.

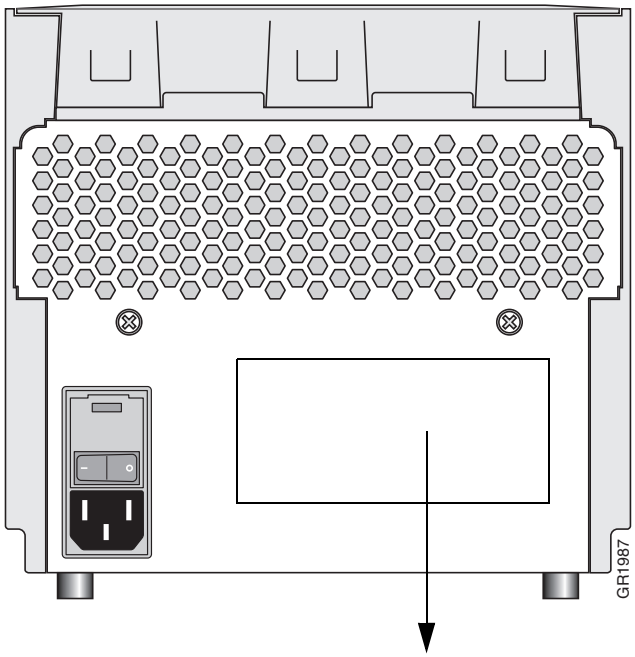
	Testing should only be carried out by qualified personnel after seeking advice from the Applied Biosystems Service Department.

Non-electrical Symbols

	This symbol illustrates a heater hazard. Proceed with caution when working around these areas to avoid being burned by hot components.

Instrument Warnings Diagram

The following diagram shows where the hazards and warnings labels are located on rear of the system 2700.



Applied Biosystems

Foster City CA94404 USA

GeneAmp PCR System 2700

Part No. 4322620

Serial No. XXXS0000001

FUSE
8 AMP T (SB) (5 x 20 MM) x 2
Use 250 V Fuse

100/120/220/230/240 VAC~
50/60 HZ
Maximum Power 420 VA

WARNING:
Risk of electric shock. Disconnect power cord from supply before replacing fuses or removing power supply module from instrument.

WARNING:
For continued protection against risk of fire, replace only with Listed and Certified fuses of the specified type and ratings.

c UL US LISTED
Laboratory Use Electrical Equipment 3Z77
Group 1, Class B

N2284

CE

Made in Singapore

Routine Maintenance for Safe Operation

Periodically clean the instrument as described on page 7-2. If you use any cleaning or decontamination method, except those recommended in the manual, you should risk damaging the equipment.

Maintain your instrument in good working order. In the event that the instrument has been subjected to adverse environmental conditions (such as fire, flood, earthquake, etc.), contact your local sales office for advice.

Instrument Safety Labels

Safety labels are located on the instrument. Each safety label has three parts:

- A signal word panel, which implies a particular level of observation or action (*e.g.,* CAUTION or WARNING). If a safety label encompasses multiple hazards, the signal word corresponding to the greatest hazard is used.
- A message panel, which explains the hazard and any user action required.
- A safety alert symbol, which indicates a potential personal safety hazard.

Before Operating the Instrument

Ensure that everyone involved with the operation of the instrument has:

- Received instruction in general safety practices for laboratories
- Received instruction in specific safety practices for the instrument
- Read and understood all related MSDSs

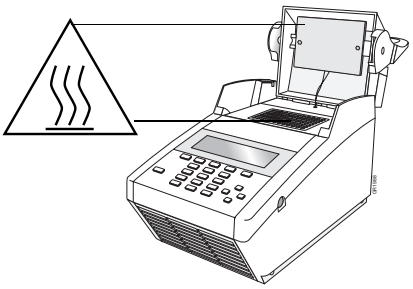
⚠ CAUTION Avoid using this instrument in a manner not specified by Applied Biosystems. Although the instrument has been designed to protect the user, this protection can be impaired if the instrument is used improperly.

Electrical Requirements

Danger of Burns

⚠ WARNING **PHYSICAL INJURY HAZARD.** Hot surface. Use care when working around this area to avoid being burned by hot components.

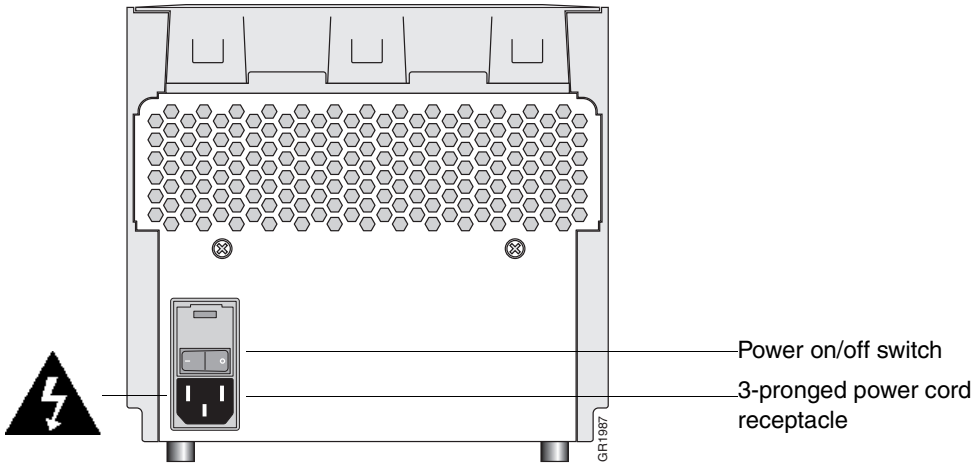
AVERTISSEMENT: Surface chaude.



Electrical Shock Hazard

⚠ WARNING **ELECTRICAL HAZARD.** To reduce the chance of electrical shock, do not remove covers that require tool access. No user-serviceable parts are inside. Refer servicing to Applied Biosystems qualified service personnel.

AVERTISSEMENT: Pour réduire le reique de chocs électriques, ne pas ouvrir les couvercies si un outil est nécessaire. Ne contient aucune pièce pouvant être réparée par l'utilisateur. Confier le dépannage au personnel qualifié de Applied Biosystems.



The 3-pronged power cord and receptacle at the instrument rear contain the grounding connector.

⚠ WARNING **ELECTRICAL HAZARD.** Grounding circuit continuity is vital for safe operation of equipment. Never operate equipment with grounding conductor disconnected.

AVERTISSEMENT: Risque de choc électrique. Pour un fonctionnement sans danger. Ne jamais utiliser l'equipment si le fil de terre n'est pas raccordé.

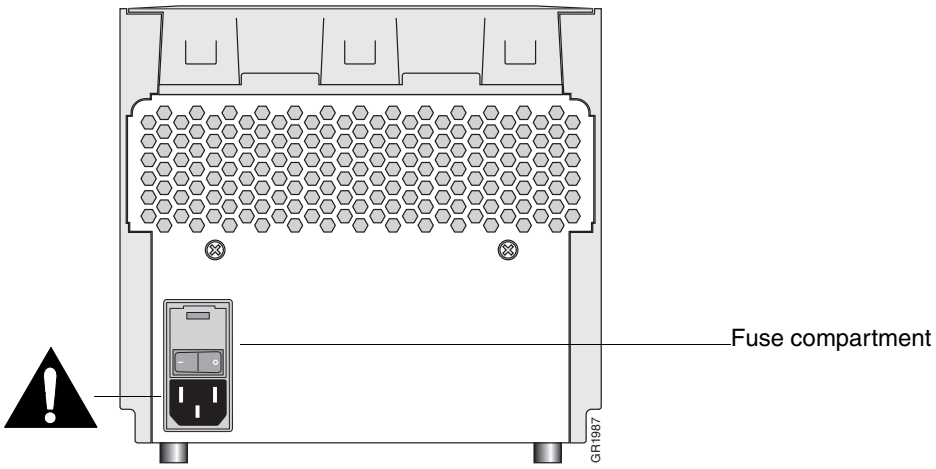
⚠ WARNING **ELECTRICAL SHOCK HAZARD.** Severe electrical shock, which could cause physical injury or death, can result from working on an instrument when the high voltage power supply is operating. To avoid electrical shock, disconnect the power supply to the instrument, unplug the power cord, and wait at least 1 minute before working on the instrument.

AVERTISSEMENT: Pour éviter les chocs électriques, débrancher le cordon d'alimentation avant le dépannage.

Fire Hazard

⚠ WARNING FIRE HAZARD. For continued protection against the risk of fire, replace fuses only with Listed and Certified fuses of the same type and rating as those currently in the instrument.

AVERTISSEMENT: Afin d'assurer la protection contre les risques d'incendie, remplacer uniquement par un fusible de méme type et de méme courant nominal.



Grounding and Electrical Safety

The system 2700 must be grounded for protection against electrical shock.

⚠ CAUTION ELECTRICAL HAZARD. Do not use an adapter to a two-terminal outlet since this does not provide positive ground protection.

Fuses

Improper fuses can damage the wiring system and cause a fire.

⚠ WARNING ELECTRICAL FIRE HAZARD. Before turning on the instrument, verify that the fuses are properly installed.

Laboratory Environmental Requirements

Introduction

Take the precautions described in this section whenever you operate the system 2700. Read this section before you install the instrument.

⚠ CAUTION The instrument should be used according to the instructions provided in this manual. If used otherwise, the protection provided by this instrument may be impaired.

Temperature, Humidity, and Environment

IMPORTANT This instrument is designed for indoor use.

IMPORTANT Do not operate in a Cold Room or a refrigerated area. The system 2700 will operate safely when the ambient temperature is 5 °C to 40 °C (41 °F to 104 °F) and will meet performance specifications when the ambient temperature is 15 °C to 30 °C and the ambient relative humidity is 20 to 80%. These specifications have been calculated for altitudes between 0 and 2,000 meters.

⚠ CAUTION **FIRE HAZARD.** This instrument is not designed for operation in an explosive environment. Do not place the instrument close to potentially explosive materials or objects.

IMPORTANT The instrument should be stored between –20 °C and 60 °C (–4 °F and 140 °F) at altitudes between 0 and 12,000 meters.

Note This instrument is able to withstand transient overvoltage according to Installation Category II as defined in IEC 1010-1.

Pollution

The installation category (overvoltage category) for this instrument is II, and it is classified as portable equipment. The instrument has a pollution degree rating of 2 and may be installed in an environment that has nonconductive pollutants only.

Emission/Immunity Statement

For our European customers, any product marked with the CE label meets the European EMC directive 89/336/EEC and the Low Voltage Directive 72/23/EEC. This product meets Class B emission limits.

Chemical Safety

Documentation User Attention Words

Five user attention words appear in the text of all Applied Biosystems user documentation. Each word implies a particular level of observation or action as described below.

Note Calls attention to useful information.

IMPORTANT Indicates information that is necessary for proper instrument operation.

⚠ CAUTION Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

⚠ WARNING Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ DANGER Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

Chemical Hazard Warning

⚠ WARNING CHEMICAL HAZARD. Some of the chemicals used with Applied Biosystems instruments and protocols are potentially hazardous and can cause injury, illness, or death.

- Read and understand the material safety data sheets (MSDSs) provided by the chemical manufacturer before you store, handle, or work with any chemicals or hazardous materials.
- Minimize contact with and inhalation of chemicals. Wear appropriate personal protective equipment when handling chemicals (*e.g.,* safety glasses, gloves, or protective clothing). For additional safety guidelines, consult the MSDS.
- Do not leave chemical containers open. Use only with adequate ventilation.
- Check regularly for chemical leaks or spills. If a leak or spill occurs, follow the manufacturer's cleanup procedures as recommended on the MSDS.
- Comply with all local, state/provincial, or national laws and regulations related to chemical storage, handling, and disposal.

Chemical Waste Hazard Warning

⚠ WARNING CHEMICAL WASTE HAZARD. Wastes produced by Applied Biosystems instruments are potentially hazardous and can cause injury, illness, or death.

- Read and understand the material safety data sheets (MSDSs) provided by the manufacturers of the chemicals in the waste container before you store, handle, or dispose of chemical waste.
- Handle chemical wastes in a fume hood.
- Minimize contact with and inhalation of chemical waste. Wear appropriate personal protective equipment when handling chemicals (*e.g.,* safety glasses, gloves, or protective clothing).
- After emptying the waste container, seal it with the cap provided.
- Dispose of the contents of the waste tray and waste bottle in accordance with good laboratory practices and local, state/provincial, or national environmental and health regulations.

About MSDSs

Some of the chemicals used with this instrument may be listed as hazardous by their manufacturer. When hazards exist, warnings are prominently displayed on the labels of all chemicals.

Chemical manufacturers supply a current MSDS before or with shipments of hazardous chemicals to new customers and with the first shipment of a hazardous chemical after an MSDS update. MSDSs provide you with the safety information you need to store, handle, transport and dispose of the chemicals safely.

We strongly recommend that you replace the appropriate MSDS in your files each time you receive a new MSDS packaged with a hazardous chemical.

⚠ WARNING CHEMICAL HAZARD. Be sure to familiarize yourself with the MSDSs before using reagents or solvents.

Ordering MSDSs

You can order free additional copies of MSDSs for chemicals manufactured or distributed by Applied Biosystems using the contact information below.

<table>
<tr><th>To order MSDSs...</th><th>Then...</th></tr>
<tr><td>Over the Internet</td><td>a. Go to our Web site at www.appliedbiosystems.com/techsupp.
b. Click MSDSs.
<table><tr><th>If you have...</th><th>Then...</th></tr><tr><td>The MSDS document number or the Document on Demand index number</td><td>Enter one of these numbers in the appropriate field on this page</td></tr><tr><td>The product part number</td><td rowspan="2">Select Click Here, then enter the part number or keyword(s) in the field on this page.</td></tr><tr><td>Keyword(s)</td></tr></table>c. You can open and download a PDF (using Adobe® Acrobat Reader) of the document by selecting it, or you can choose to have the document sent to you by fax or email.</td></tr>
<tr><td>By automated telephone service from any country</td><td>See “To Obtain Documents on Demand” on page A-4.</td></tr>
<tr><td>By telephone in the United States</td><td>Dial 1-800-327-3002, then press 1.</td></tr>
<tr><td>By telephone from Canada</td><td><table><tr><th>To order in...</th><th>Then dial 1-800-668-6913 and...</th></tr><tr><td>English</td><td>Press 1, then 2, then 1 again</td></tr><tr><td>French</td><td>Press 2, then 2, then 1</td></tr></table></td></tr>
<tr><td>By telephone from any other country</td><td>See “To Contact Technical Support by Telephone or Fax” on page A-2.</td></tr>
</table>

For chemicals not manufactured or distributed by Applied Biosystems, call the chemical manufacturer.

About Waste Disposal

As the generator of potentially hazardous waste, it is your responsibility to perform the actions listed below.

- Characterize (by analysis if necessary) the waste generated by the particular applications, reagents, and substrates used in your laboratory.
- Ensure the health and safety of all personnel in your laboratory.
- Ensure that the instrument waste is stored, transferred, transported, and disposed of according to all local, state/provincial, or national regulations.

Note Radioactive or biohazardous materials may require special handling, and disposal limitations may apply.

System Overview 2

Overview

About This Chapter This chapter provides an introductory overview to the GeneAmp® PCR System 2700.

In This Chapter This chapter contains the following topics:

Topic	See Page
Introducing the GeneAmp PCR System 2700	2-2
About the Control Panel	2-4
Overview of Functions	2-5
Introducing an Important Screen	2-6

Introducing the GeneAmp PCR System 2700

About the Instrument

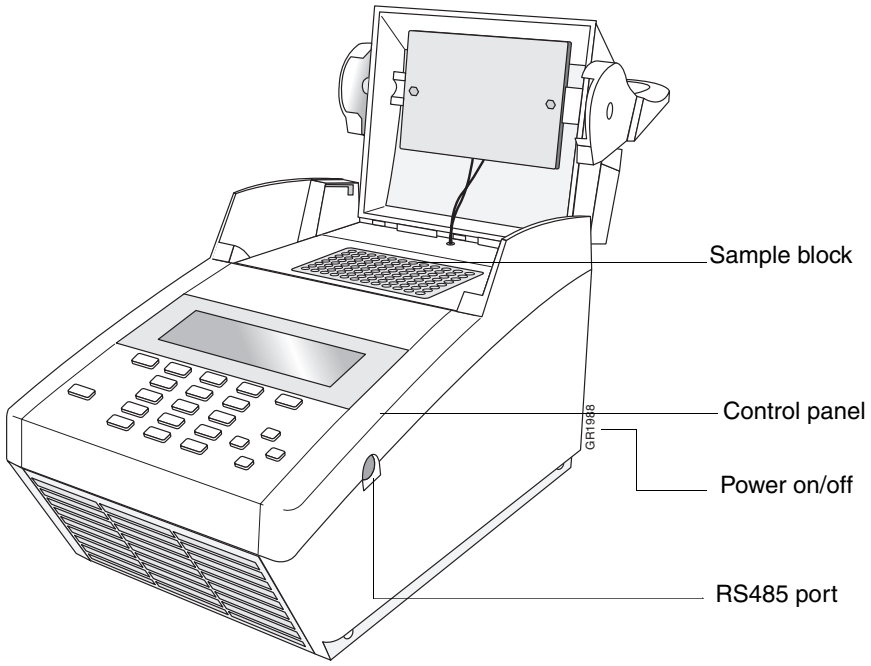
The GeneAmp® PCR System 2700 is an automated instrument, specifically designed for the amplification of nucleic acids using the GeneAmp Polymerase Chain Reaction (PCR) process.

The instrument has an integrated 96-well sample block, which houses an internal Peltier heating/cooling unit. The sample block is made of aluminum to provide optimal thermal transfer rate.

Platinum sensors provide:

- Wide temperature range: 4 °C to 99.9 °C
- Accuracy: ±0.25 °C from 35 °C to 100 °C
- Long term stability and high reliability

The sample block accommodates several different types of MicroAmp® disposable tubes and plates, which must be used in order to create a sealed chamber.



The system 2700 has an easy-to-use, intuitive user interface, which is described in “About the Control Panel” on page 2-4.

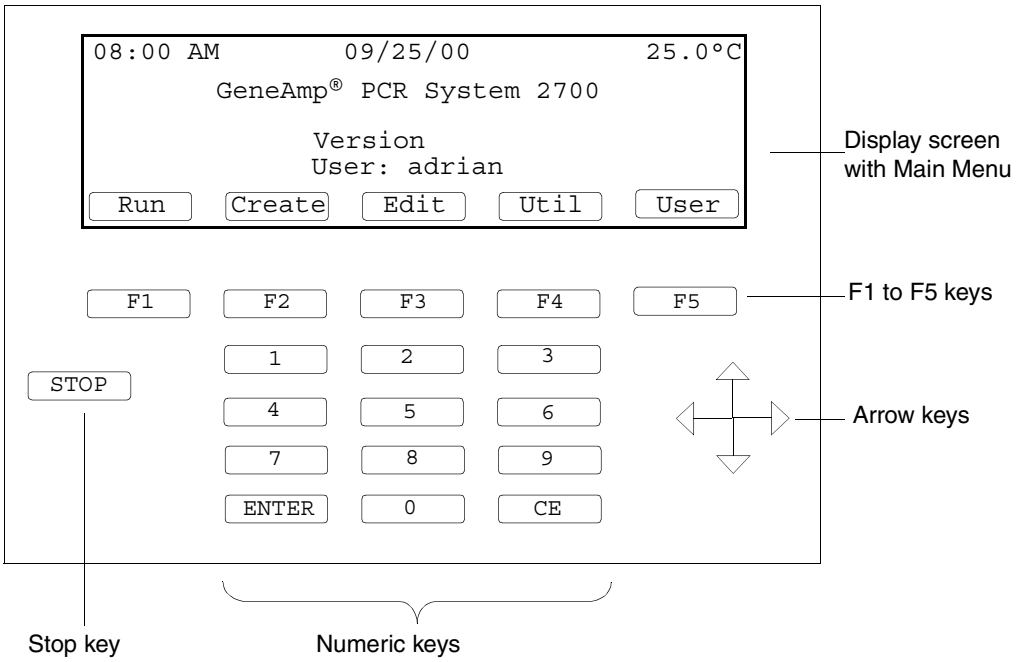
Comparing the System 2700 to Previous Instruments

The system 2700 can be compared to the GeneAmp® PCR System 9700, as shown below:

System 2700	System 9700
♦ Almost the same user interface as previous instruments	♦ Interchangeable sample blocks with 60, 96, or dual-384 wells
♦ Integrated sample block	♦ Networking capabilities
♦ Uses same disposables as 96-well sample block on system 9700	♦ High “instrument diagnostics” capabilities
♦ Small footprint	♦ Variable ramp rates and cycling speeds
♦ Instruments can be “packed” side-by-side on a bench because the air flows out the back, rather than the sides.	♦ PCMCIA slot for software upgrade and Methods Transportability card

About the Control Panel

Overview The control panel for the system 2700 consists of a display screen and keys, including function keys (F1–F5), numeric keys, arrow keys, and the Enter, CE, and Stop keys, as shown in the figure below.



Display The display screen is a window that you use for communicating with the instrument's software.

F1 to F5 Keys Use the function keys (F1 to F5) to activate the "button" on the screen above the key; for example, F1 for Run. The display is not a touch screen. Throughout this manual you will find instructions to press F1 (Run) or press F2 (Create). The function keys permit you to navigate from screen to screen and perform other actions.

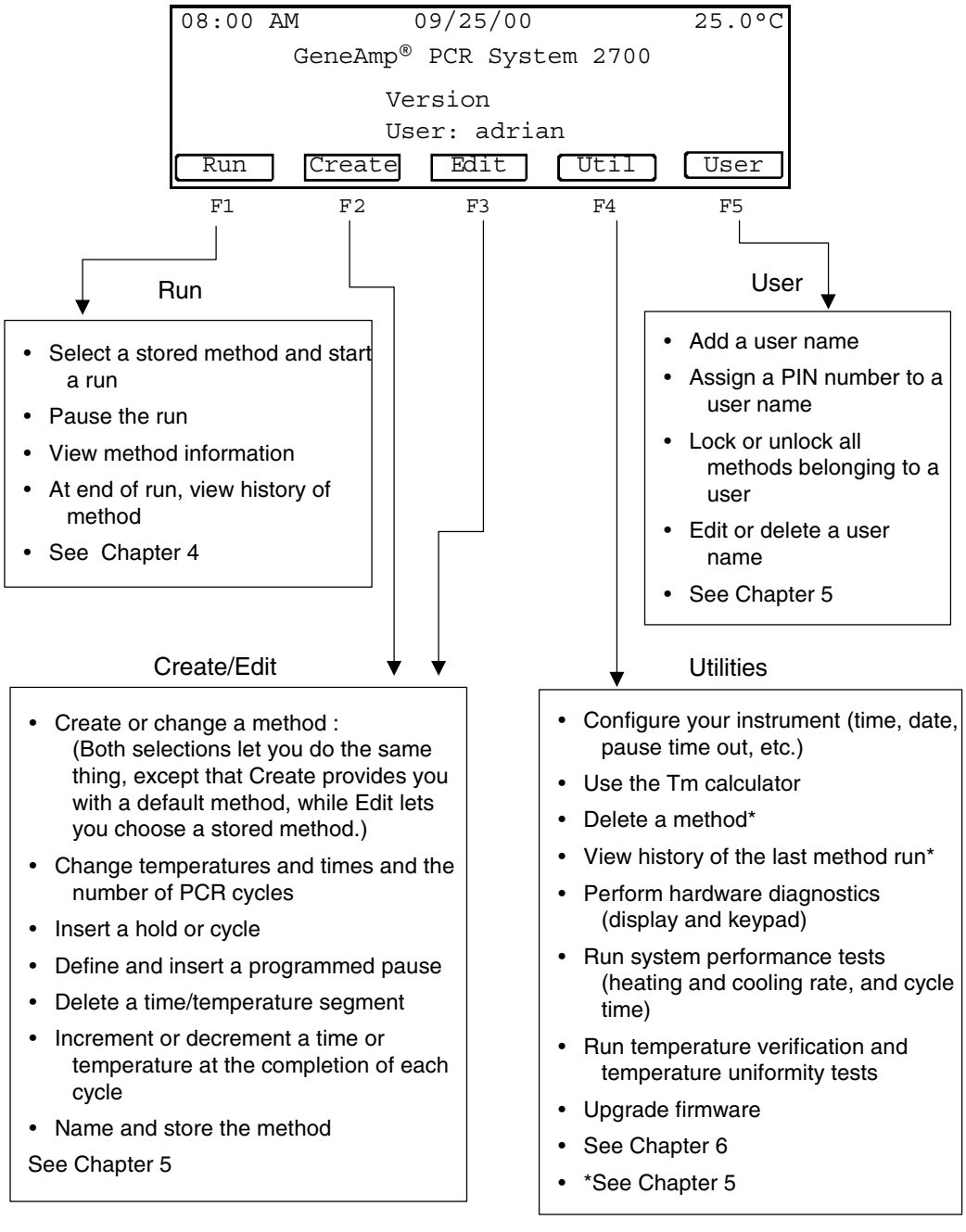
Selecting a Field Most screens have a highlighter that you use to select a field. To move the highlighter, use the arrow keys or the Enter key.

Entering Numbers Use the numeric keys (0–9) to enter numeric values, then press Enter or an arrow key. When you type temperatures and times (minutes:seconds), the system takes care of the decimal point and colon, respectively. If necessary, you can use the CE key to clear a field and then reenter values.

Overview of Functions

Main Menu as Base

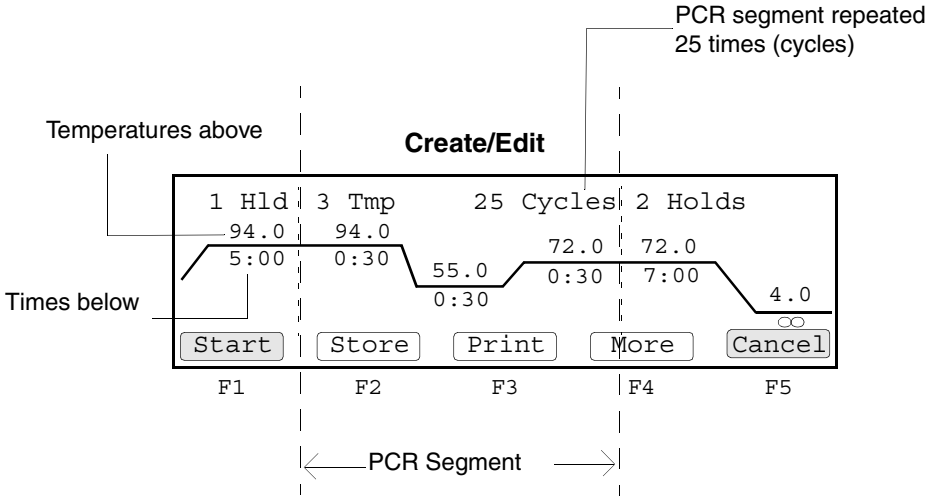
The Main Menu is the base from which you start all instrument functions. From it you can choose five different paths: Run, Create, Edit, Util (Utilities), and User. The functions available from each of these paths are summarized in the chart below. Procedures for performing these functions are given in subsequent chapters. Charts showing screen flows from each path on the Main Menu are provided in Appendix D, "Screen Flowcharts."


08:00 AM 09/25/00 25.0°C
GeneAmp® PCR System 2700
Version
User: adrian
Run
Create
Edit
Util
User
F1
F2
F3
F4
F5
Run
• Select a stored method and start a run
• Pause the run
• View method information
• At end of run, view history of method
• See Chapter 4
User
• Add a user name
• Assign a PIN number to a user name
• Lock or unlock all methods belonging to a user
• Edit or delete a user name
• See Chapter 5
Create/Edit
• Create or change a method : (Both selections let you do the same thing, except that Create provides you with a default method, while Edit lets you choose a stored method.)
• Change temperatures and times and the number of PCR cycles
• Insert a hold or cycle
• Define and insert a programmed pause
• Delete a time/temperature segment
• Increment or decrement a time or temperature at the completion of each cycle
• Name and store the method
See Chapter 5
Utilities
• Configure your instrument (time, date, pause time out, etc.)
• Use the Tm calculator
• Delete a method*
• View history of the last method run*
• Perform hardware diagnostics (display and keypad)
• Run system performance tests (heating and cooling rate, and cycle time)
• Run temperature verification and temperature uniformity tests
• Upgrade firmware
• See Chapter 6
• *See Chapter 5

Introducing an Important Screen

Create/Edit Screen

One of the features that makes the system 2700 easy to use is its graphical representation of a method, as shown below on the Create/Edit screen. The graph is the wavy line.



A *method* is a set of instructions in which you specify how the instrument should heat and cool your samples in a PCR thermal profile.

On the Create/Edit screen, temperatures are shown above the graph in degrees Celsius. Hold times in minutes and seconds are shown below the graph. The central portion of the screen, delineated by dashed lines, is the PCR segment. In this example, the PCR segment repeats 25 times. After PCR (in the post-PCR segment), the instrument holds the samples at 72 °C for 7 minutes, then cools to 4 °C and holds the samples at this temperature until you stop the run.

Getting Started 3

Overview

About This Chapter

This chapter walks you through some basic procedures to help you learn to use the GeneAmp® PCR System 2700.

The system 2700 is intuitive and easy to use. We'll start by using the instrument without samples and experiment with the user interface. The following pages describe how to set yourself up as a user and create a method. Other features are introduced later in the chapter.

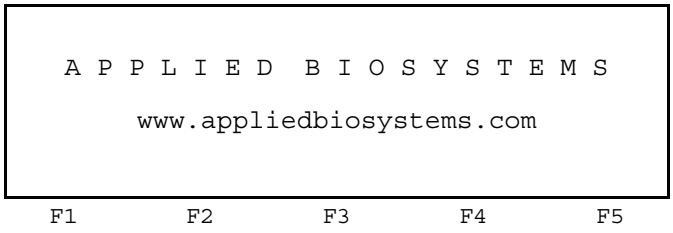
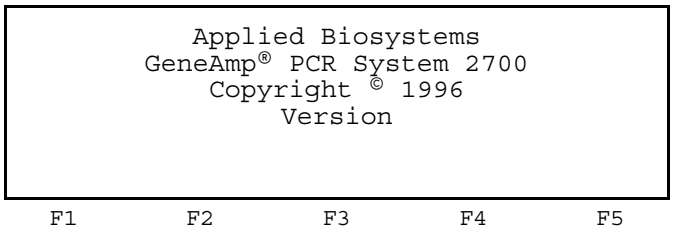
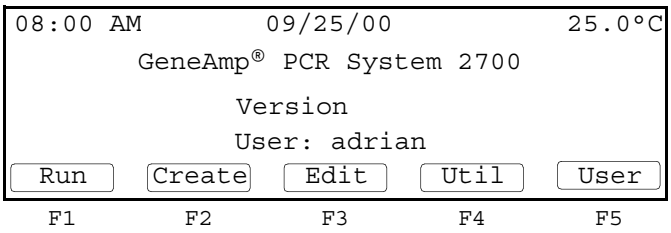
In This Chapter

This chapter contains the following topics:

Topic	See Page
Powering On	3-2
Adding Yourself as a User	3-3
Creating a Method	3-5
Editing Your Method	3-7
Starting and Stopping a Run	3-8
More Features	3-10

Powering On

Procedure To turn on the instrument power:

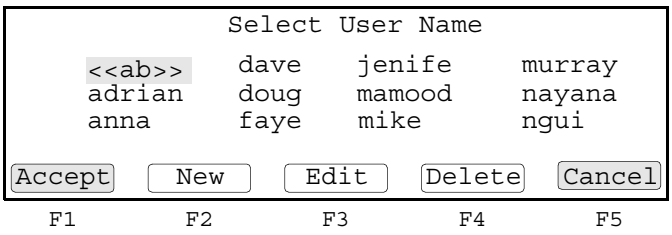
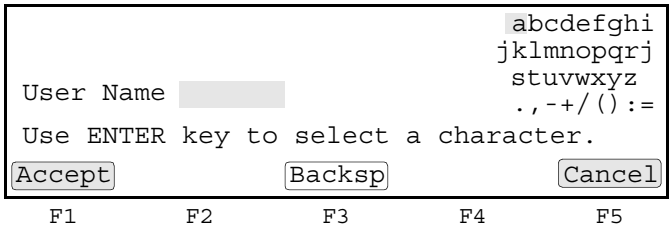
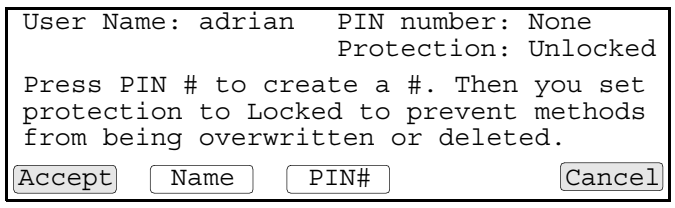
Step	Action
1	Press the power on/off switch at the rear of the instrument. A whirring fan sounds, and the Splash screen appears briefly.  The Startup screen appears. 
2	Wait several seconds for the Main Menu to appear, then you can use any of the functions displayed above the function keys.  **Note** The Main Menu should appear within a few seconds. If any permanent patterns of lines or bars display on the screen, refer to our Web site.[a]

a. http://www.appliedbiosystems.com/2700

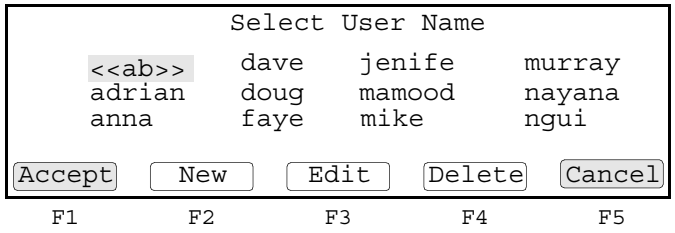
Adding Yourself as a User

Purpose It's important to add yourself as a user because you will want to keep your methods separate from those belonging to others. Also, the system requires a user name when you store a method.

Procedure To add yourself as a user:

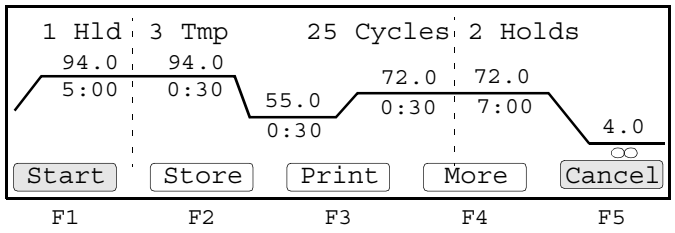
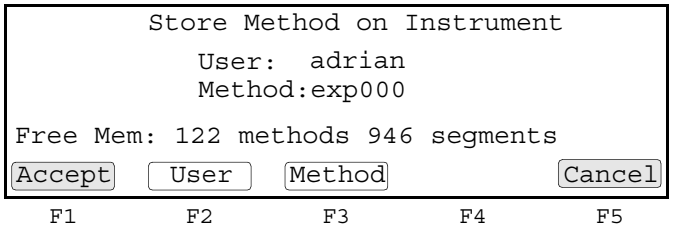
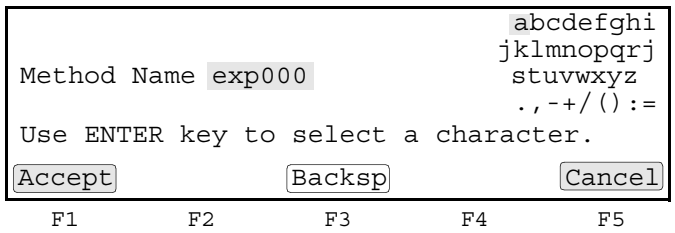
Step	Action
1	From the Main Menu press **F5** (User). The Select User Name screen appears. 
2	Press **F2** (New). The User Name screen appears. **Note** The blank space after the z is used to insert blank spaces. 
3	Spell out your name by using the arrow keys to move the highlighter at the right of the screen to the first letter of your name, then press **Enter**, then highlight the second letter and press **Enter**, etc. When you have finished entering your name (up to six characters), press **F1** (Accept) to save it. The Security Code screen appears. 

To add yourself as a user: *(continued)*

Step	Action
4	Press **F5** (Cancel). You can learn about security later. The Select User Name screen appears. 
5	With your name highlighted, press **F1** (Accept) to return to the Main Menu.

Creating a Method

Procedure To create a method :

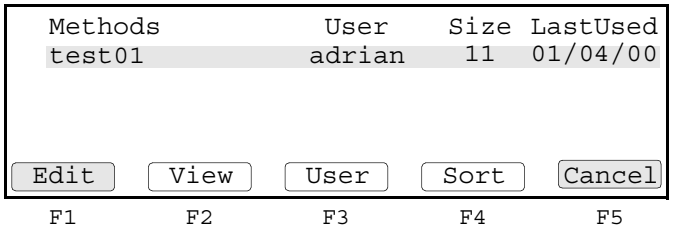
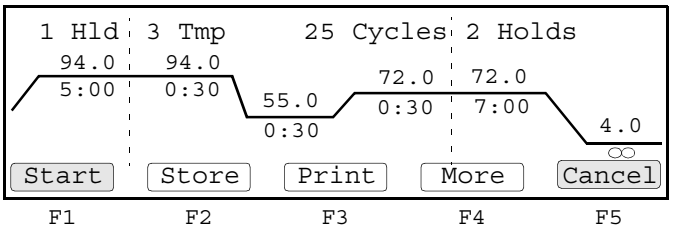
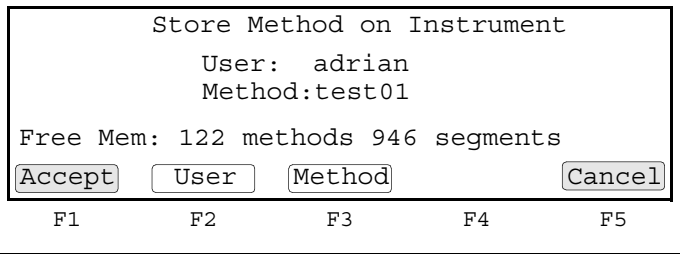
Step	Action
1	From the Main Menu press **F2** (Create). The Create/Edit screen appears with a default method displayed. 
2	Use the arrow keys to move the highlighter to a temperature or time on the graph and change the parameter. For example, move the highlighter to the 5:00 time at the left of the screen in the pre-PCR portion. Press **5 3 0** then press **Enter**, for 5:30.
3	Make a change to the top line. For example, use the arrow keys to move the highlighter to the 1 in the upper left corner of the screen. Press **2**, then **Enter**. Notice that you've added a hold (another time and temperature segment) to the graph.
4	Press **F2** (Store) to save the method. The Store Method on Instrument screen appears.  The system has given the method a default name of "exp000". We will use a different name.
5	Press **F3** (Method). The Method Name screen appears. 
6	Press the **CE** key to clear the field. Then spell out **test01** by highlighting each letter and pressing **Enter** after each one.

To create a method *(continued)*:

Step	Action
7	Press **F1** (Accept). The Store Method on Instrument screen appears again with “test01” as the method name. On the system 2700, a method has a method name, and it is associated with a particular user.
8	Press **F1** (Accept). The system saves your method and returns to the Main Menu.

Editing Your Method

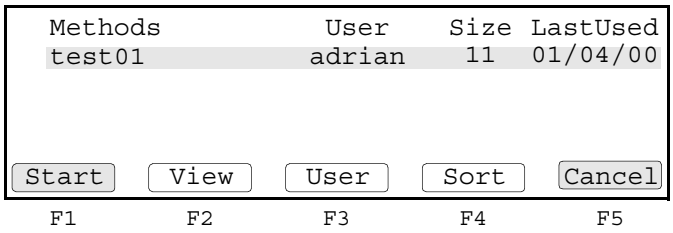
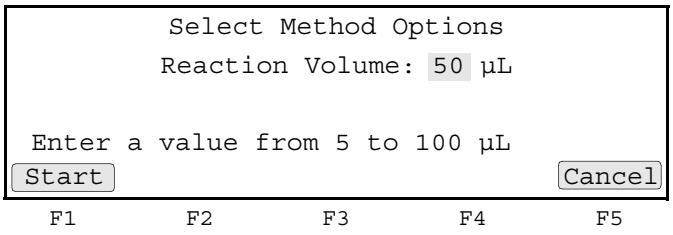
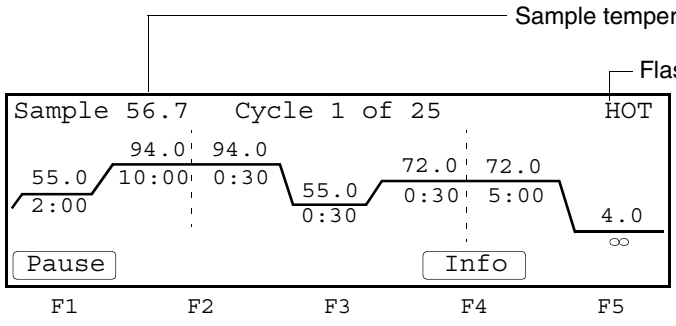
Procedure To edit the method :

Step	Action
1	From the Main Menu press **F2** (Edit). The Stored Methods screen appears. You have only one method, so it's already highlighted. If there were more than one method listed, you would highlight it to select it. 
2	Press **F1** (Edit). The Create/Edit screen appears. This is the same screen you accessed from the Create path from the Main Menu. The Create and Edit paths allow you to do the same things once you reach this screen. 
3	Move the highlighter to any parameter and change it. For example, move the highlighter to 94.0 in the Pre-PCR segment and press **9 0 0** then **Enter** for 90.0 °C.
4	Press **F2** (Store). The Store Method on Instrument screen appears. 
5	Press **F1** (Accept) to save the method under the same name ("test01"). The Main Menu is displayed.

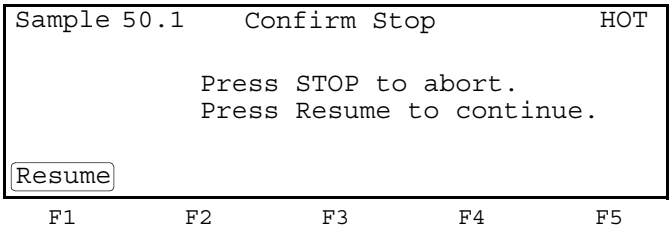
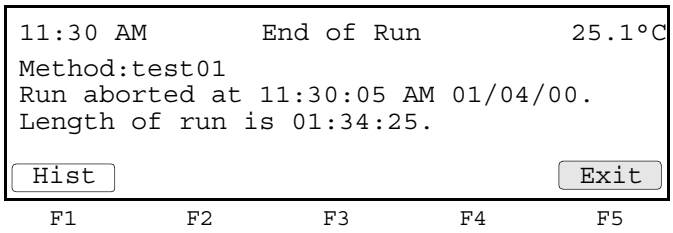
Starting and Stopping a Run

Before You Begin Let's assume that we've loaded our samples properly and we're ready to start a run.

Procedure To start, then stop a run :

Step	Action
1	From the Main menu press **F1** (Run). The Stored Methods screen appears.  Since we have only one method ("test01"), it's already highlighted (selected).
2	Press **F1** (Start). The Select Method Options screen appears. 
3	Change the reaction volume to 40, then press **F1** (Start). The Run Time screen appears. 

To start, then stop a run *(continued)*:

Step	Action
4	Press the **Stop** key. The Confirm Stop screen appears. 
5	Press the **Stop** key again to abort the run. The End of Run screen appears. 
6	Press **F5** (Exit) to return to the Main Menu.

More Features

Overview

Now you know the basics of operating the system 2700. The system provides additional features. Some things you might try are discussed below.

Navigating from the Main Menu

Explore paths from the Main Menu to find out what's available on the system. Refer to the charts in Appendix D, "Screen Flowcharts."

Looking at Methods

Look at a list of all methods, sort the list, and view individual methods:

- List all methods on the instrument. Access the Stored Methods screen by pressing F1 (Run) or F5 (Edit) on the Main Menu. Then press F3 (User) to reach the Select User Name screen. Press F2 (All) to display the Stored Methods screen listing all methods on the system. Use the down and up arrow keys to scroll through the list.
- Sort the methods by pressing F4 (Sort).
- View any method by pressing F2 (View).
- Select yourself as the user again by pressing F3 (User), highlighting your name, then pressing F1 (Accept).

Creating Your Method

Create your most commonly used method. If your method is more complex than the one we edited earlier, you can change it using one of the following:

- Insert a hold or cycle
- Define and insert a programmed pause
- Automatically increment or decrement a time or temperature at the completion of each cycle
- Delete a segment

These functions can be accessed from the Modify screen, which is reached by pressing F4 (More) on the Create/Edit screen. See the Create/Edit chart on page D-4.

Accessing More Run Screens

Start a run to see what else is available from the Run path from the Main Menu. After you start a run, the Run Time screen, which shows a graph of your method, appears. From there you can do the following:

- View the Method Information screen by pressing F4 (Info)
- Briefly pause, then resume a run by pressing F1 (Pause)
- Stop the run by pressing the Stop key twice. From the End of Run screen, press F1 (Hist) to view the History File.

Protecting Your Methods

Consider using a PIN number and locking your methods.

Each user of the system 2700 should have his/her own user name. That way, each person's methods can be kept separate. When you add a user name, the system prompts you to create a PIN number. If you have a PIN number, no one can change your user name. Once you have created a PIN number for yourself and confirmed it, the system allows you to lock your methods. By default they are unlocked. Locking

safeguards **all** your methods. Only someone who knows your PIN number can overwrite or delete any of your methods.

When you attempt to change and store one of your methods after locking them, the system protects you by prompting you to enter your PIN number before it will allow you to store the method. This is a small inconvenience for the benefit it provides. When you are creating a new method, the system does not prompt you for your PIN number.

If you decide you don't want your methods locked, you can easily change them back to unlocked.

To learn how to protect your methods, see the User chart on page D-5.

4 Runs

Overview

About This Chapter

This chapter tells what you need to know to run your samples: the MicroAmp® disposables you use to hold your samples, how to load samples, and how to start and stop a run.

In This Chapter

This chapter contains the following topics:

Topic	See Page
Using Disposables	4-2
Loading Samples	4-5
Starting a Run	4-7
Pausing or Stopping a Run	4-9
Reviewing the History of a Run	4-11
When a Run Completes	4-13

Using Disposables

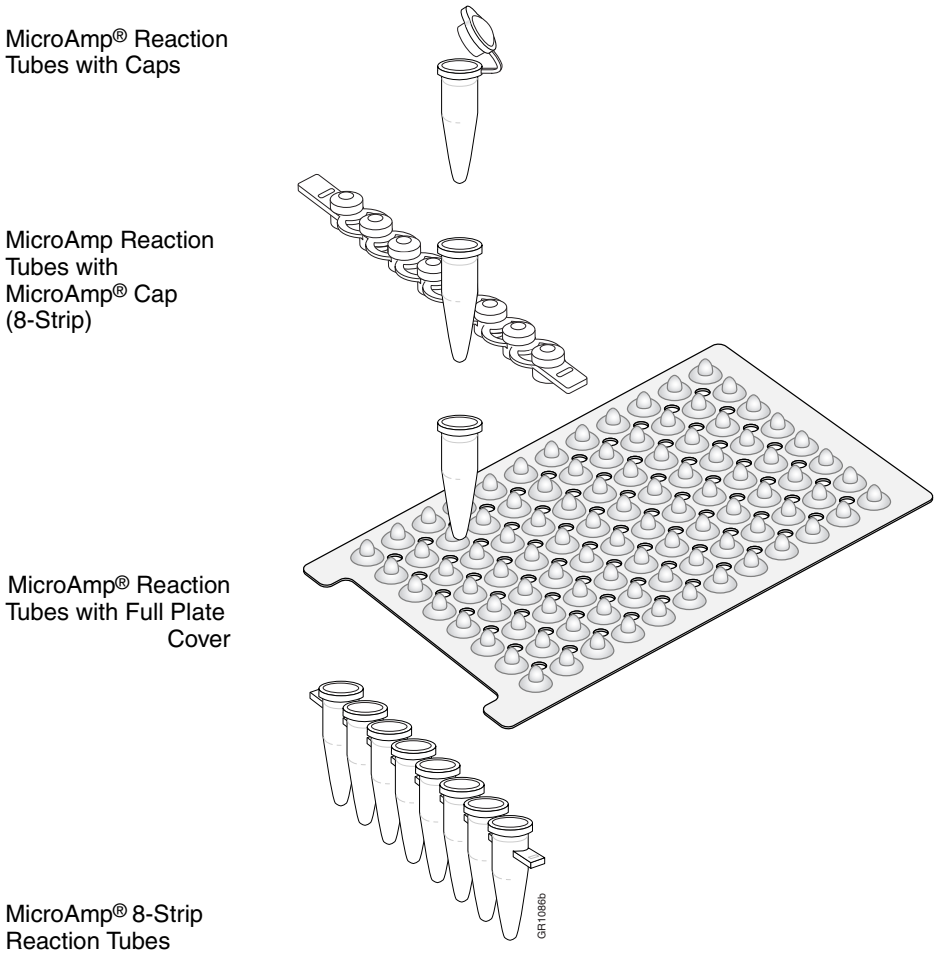
Introduction

The following section describes the possible tube configurations, choosing a tube configuration, and sample tray and plate configurations.

IMPORTANT The Tray or the Tray/Retainer are essential for the operation of the GeneAmp® PCR System 2700.

Tube Configurations

The MicroAmp disposables you can use to hold your PCR samples include four different types of tube configurations, as shown in the figure below.


MicroAmp® Reaction Tubes with Caps
MicroAmp Reaction Tubes with MicroAmp® Cap (8-Strip)
MicroAmp® Reaction Tubes with Full Plate Cover
MicroAmp® 8-Strip Reaction Tubes
GR1086b

Choosing a Tube Configuration

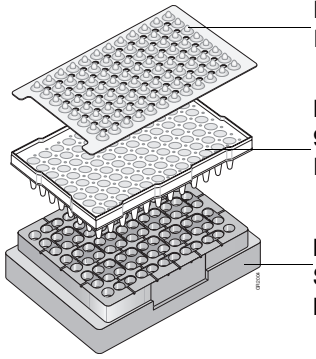
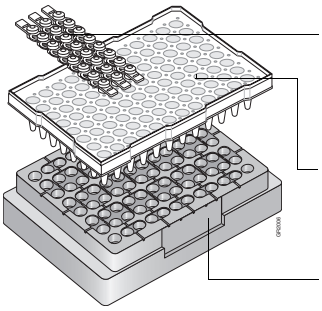
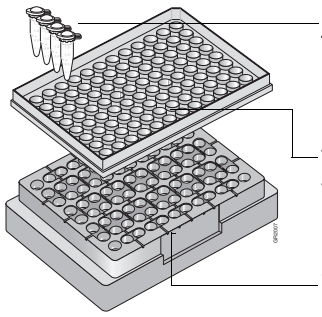
Use the table below to help you choose a tube configuration.

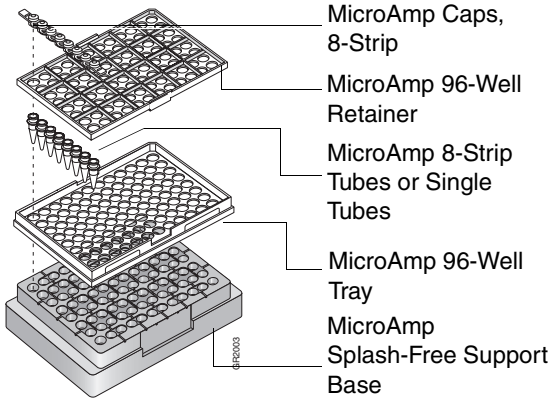
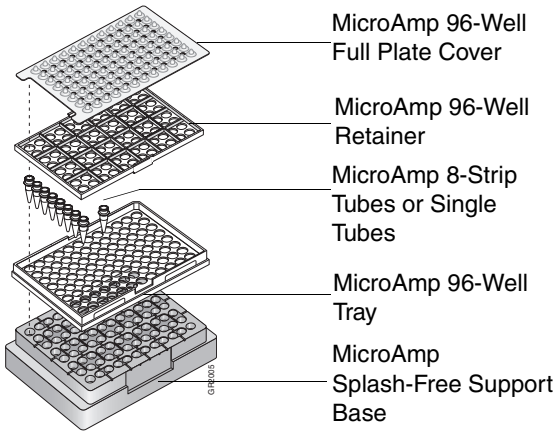
You can prepare samples for the instrument using any of the four tube configurations. All the tube configurations, except the MicroAmp Reaction Tubes with Caps use the MicroAmp® 96-Well Tray/Retainer.

If you want to use...	Choose a tube configuration that uses the...
eight or more samples	MicroAmp 96-Well Tray/Retainer.
♦ Only a few samples, or ♦ Want to remove single tubes from the sample block without removing the caps from all the tubes	MicroAmp Tray for tubes with attached caps.

Sample Tray and Plate Configurations

The following table lists the possible sample tray and plate configurations. The MicroAmp® Splash-Free Support Base shown below is used when loading samples but should not be placed in the sample block.

With this vessel...	Use...	As Shown
MicroAmp® Optical 96-Well Reaction Plate	MicroAmp 96-Well Full Plate Cover	
	MicroAmp Caps, 8 Caps/Strip	
MicroAmp Reaction Tubes with Caps	MicroAmp® 96-Well Tray for Tubes with Caps	

With this vessel...	Use...		As Shown
MicroAmp 8 Strip Tubes or Single Tubes	MicroAmp 96-Well Tray/Retainer	MicroAmp Caps, 8 Caps/Strip	
		MicroAmp 96-Well Full Plate Cover	

Part Numbers

You can order disposables for the system 2700 from Applied Biosystems by part number.

Disposable	Part Number
MicroAmp 96-Well Tray/Retainer Sets	403081
MicroAmp Multipurpose Tool	413950
MicroAmp Splash-Free Support Base	4312063
MicroAmp Reaction Tubes	N801-0533
MicroAmp Caps, 12 Caps/Strip	N801-0534
MicroAmp Caps, 8 Caps/Strip	N801-0535
MicroAmp Reaction Tubes with Caps	N801-0540
MicroAmp 96-Well Tray for Tubes with Caps	N801-0541
MicroAmp 96-Well Full Plate Cover	N801-0550
MicroAmp Optical 96-Well Reaction Plate	N801-0560
MicroAmp 8-Strip Reaction Tubes	N801-0580
MicroAmp Centrifuge Adapter	N801-3822

Loading Samples

Procedures for Loading Samples

The following procedures describe how to load samples for:

- Tubes with attached caps.
- 96-well reaction plate.
- 96-well tray/retainer assembly.

Note Do not use mineral oil or glycerine in the sample block or as a vapor barrier over the PCR reaction mixture in the tubes. The MicroAmp Reaction Tubes fit tightly in the wells and a heated cover exerts an even pressure on all tubes and eliminates condensation on the tubes.

Loading Tubes with Attached Caps

To load tubes with attached caps:

Step	Action
1	Set the 96-well tray on a splash-free support base.
2	Place the reaction tubes in the tray.
3	Pipette the samples into the reaction tubes.
4	Cap the tubes. See “Placing the Sample Tray or Plate onto the Sample Block” on page 4-6.

Loading the 96-Well Reaction Plate

To load the 96-well reaction plate:

Step	Action
1	Place the reaction plate on the splash-free support base.
2	Pipette the samples into the sample wells.
3	Cap the tubes using either the MicroAmp 96-Well Full Plate Cover or the MicroAmp Caps, 8 Caps/Strip. See “Placing the Sample Tray or Plate onto the Sample Block” on page 4-6.

Loading the 96-Well Tray/Retainer

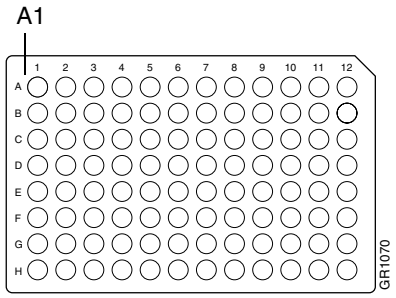
To load the 96-well tray/retainer:

Step	Action
1	Place the tray on the splash-free support base.
2	Load tubes onto the tray, either using single tubes or using the 8-strip tubes.
3	Place retainer over the tubes.
4	Pipette the sample into the tubes.
5	Cap the tubes using either the MicroAmp 96-Well Full Plate Cover or the MicroAmp Caps, 8 Caps/Strip. See “Placing the Sample Tray or Plate onto the Sample Block” on page 4-6.

Placing the Sample Tray or Plate onto the Sample Block

The steps for placing the sample tray in the block are the same for a sample tray/retainer, a sample tray without a retainer, for tubes with attached caps, or for the 96-well plate.

To place the sample tray in the block:

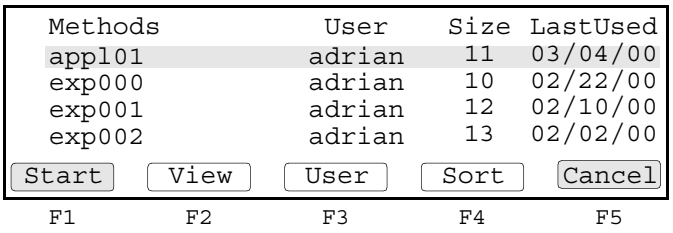
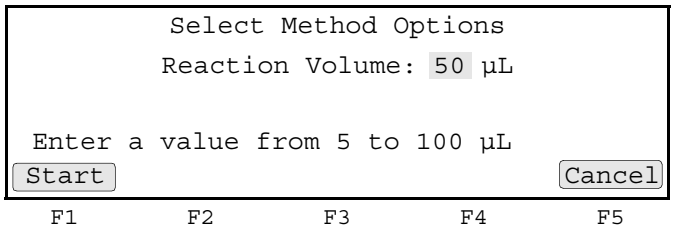
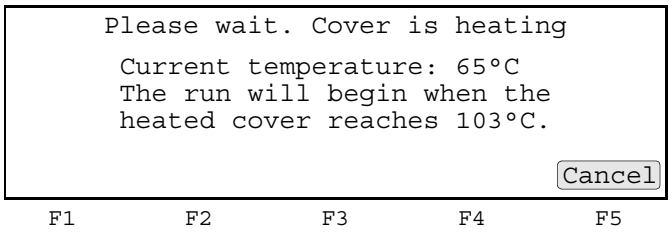
Step	Action
1	Lift the sample tray from the splash-free support base and place it in the sample block. Place the MicroAmp Tray or Plate onto the sample block so that the well numbered A1 is located at the upper left corner of the tray, as shown below. This orients the tray for proper fit.  **IMPORTANT** Do not place the base in the sample block.
2	Pull the lever down to engage the heated cover and the sample tray.

Removing the Samples

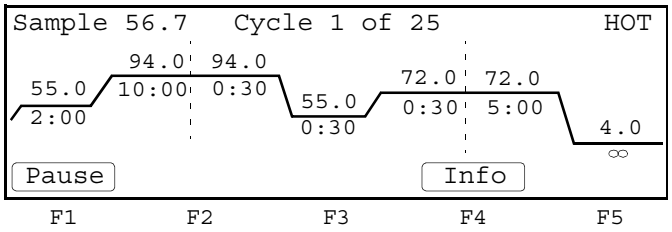
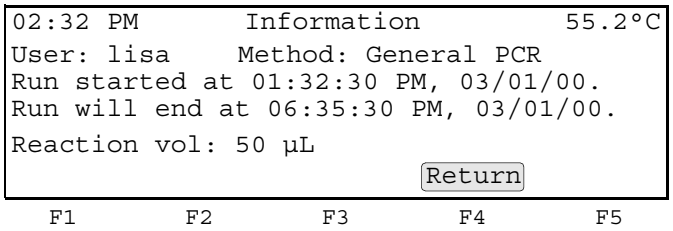
Sample caps may pop off if the cover is opened when the block temperature is above 27 °C.

Starting a Run

Procedure To start a run:

Step	Action
1	Load your samples, as described in “Loading Samples” on page 4-5. **Note** Disposables must be used.
2	If the instrument power is not on, press the power-on button at the front of the instrument.
3	From the Main Menu press **F1** (Run). The Stored Methods screen appears. 
4	Select a method by highlighting one of the displayed methods. If the method you want is not displayed, see “Handling Methods” on page 5-18.
5	Press **F1** (Start). The Select Method Options screen appears. 
6	Enter the reaction volume, then press **F1** (Start). If the temperature of the heated cover is less than 103 °C, the screen shown below appears. 

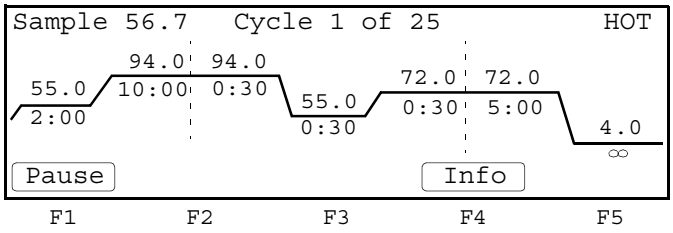
To start a run: *(continued)*

Step	Action
7	Wait for the heated cover to reach 103 °C. The Run Time screen displays and the method you selected starts running. 
8	*Optional.* To find out when the run will end, press **F4** (Info). The Method Information screen appears.  When you are through viewing this screen, press **F4** (Return) to redisplay the Run Time screen.

Pausing or Stopping a Run

Overview This section describes how you can pause a run or stop it completely.

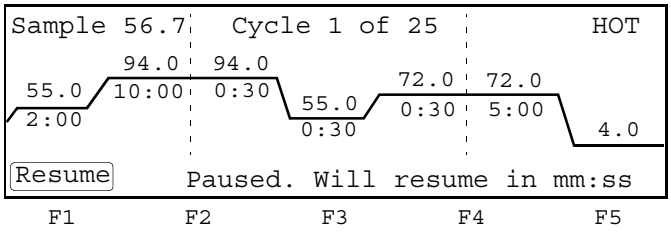
Pausing a Run During a run, the Run Time screen is displayed.



From this screen you can pause a run for a prespecified length of time and then resume it. For example, you might pause a run in order to add a reagent.

Note Do not touch the sample block or the bottom of the heated cover during a pause.

To pause a run:

Step	Action
1	With the Run Time screen displayed, press **F1** (Pause). The Pause screen appears. 
2	To resume the run, press **F1** (Resume) to return to the Run Time screen.

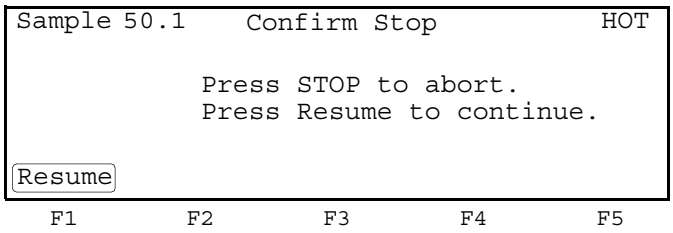
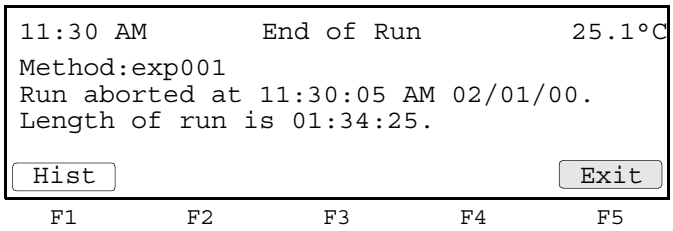
During a pause, the samples remain at the temperature they were paused at. The instrument resumes the run automatically if the pause time out expires before you press F1 to resume the run.

By default the pause time out period is 10 minutes. To specify a different time, see “Configuring the Instrument” on page 6-2.

Stopping a Run

The Stop key can be used to stop a run.

To stop a run before it completes:

Step	Action
1	Press the **Stop** key. The Confirm Stop screen appears. 
2	Press the **Stop** key again to stop the run. The run stops and the End of Run screen appears.  If any errors occur during a run, the following message appears: “Exception occurred, check history file.” Press **F1** (Hist) to review the history file. For more information, see the following section.
3	Press **F5** (Exit) to return to the Main Menu.

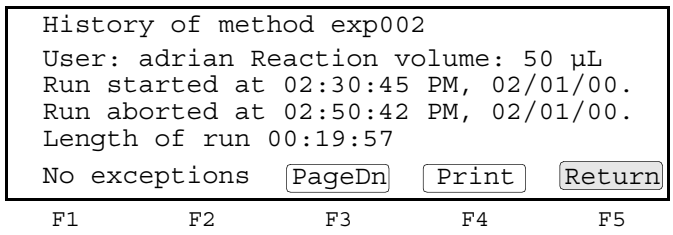
In the above procedure, after the Stop key was pressed the first time, the run could have been resumed within the prespecified time (default is 10 minutes). This time is the same pause time out discussed in “Pausing a Run” on page 4-9. The instrument aborts the run automatically if the pause time out expires before you press F1 to resume the run.

Reviewing the History of a Run

Reviewing the History

From the End of Run screen or the Utilities path, you can display the History File screen, which provides information about the run that just ended. This information includes the events and errors that occured during the run. The instrument stores this information until it is overwritten by the next method used.

To review the history:

Step	Action
1	Access the History File screen by: ♦ Pressing **F1** (Hist) from the End of Run screen, or ♦ Pressing **F4** (Util) from the Main Menu, then **F4** (More) from the Utilities 1 screen, then **F3** (Hist) from the Utilities 2 screen. 
2	Press **F3** (Page Dn) or **F2** (Page Up) to scroll through the file.
3	*Optional.* Press **F4** (Print) to print the record.

History Formats

The following table lists the history line formats.

Pre-PCR hold	<Exception> in Pre-PCR xx Setpt xx
PCR segment	<Exception> in Cycle xx Setpt xx Repxx
Any other hold	<Exception> in Hold xx Setpt xx

History File Records

The following table lists the history file record, a description of the record, and the type of record.

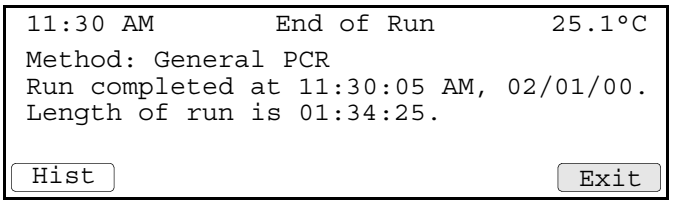
Record	Description	Type
History of method xxxxxxxxxxxxxxx User xxxxxx Reaction volume xxx µL Run started at hh:mm:ss am mm/dd/yy Run ended at hh:mm:ss am mm/dd/yy Length of run hh:mm:ss RampSpeed: 9600	This header record is always created.	Report
Power failure in Cycle xx at Setpt xx. Power failed at hh:mm:ss am for hh:mm:ss. Run resumed at hh:mm:ss am	There was a power failure during a specified point in a cycle. The message, for >18, indicates that the power was off for more than 18 hours.	Report
Drift error in Cycle xx Setpt xx Repxx. Temperature drifted x.x°c from setpt	Block drift error. The block has drifted ± 2 °C from set point during the hold segment of a run.	Report
Cover error in Cycle xx Setpt xx Repxx. Heated cover at xx.x°c	Heated cover drift error. The cover has drifted ± 5 °C from 105 °C anytime during the run.	Report
Sensor error in Cycle xx Setpt xx Repxx. Block sensor failure.	Block sensor failure.	Fatal error. Access our Web site.[a]
Sensor error in Cycle xx Setpt xx Repxx. Cover sensor failure.	Heated cover sensor failure.	Fatal error. Access our Web site.[a]
Setpt error in Cycle xx Setpt xx Repxx. Could not reach xx.x in hh:mm:ss	This setpoint error is only logged for setpoints above 15 °C. The limit is 5 times the normal ramping time.	Fatal error. Access our Web site.[a]
Program pause in Cycle xx Setpt xx Rep xxx Method paused at xx °C for hh:mm:ss	A programmed pause was encountered.	Report
Manual pause in Cycle xx Setpt xx Rep xxx Method paused at xx °C for hh:mm:ss	You paused the run.	Report

a. http://www.appliedbiosystems.com/2700

When a Run Completes

End of Run Screen

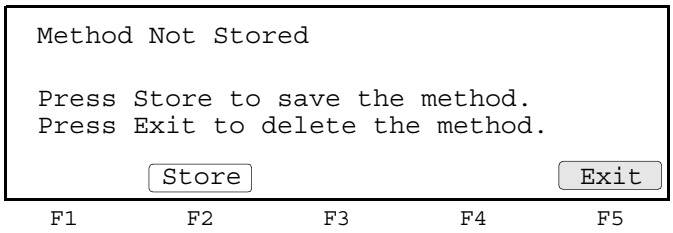
When a run ends, the End of Run screen appears. However, if your method has an indefinite hold of 4 °C (for example), you must first press the Stop key to display the screen shown below.



If you created a new method but have not stored it, when F5 (Exit) is pressed, the Method Not Stored screen displays to give you the opportunity to save the method before returning to the Main Menu.

Method Not Stored Screen

If you attempt to exit the End of Run screen before storing a new method, the Method Not Stored screen appears.



If you want to store the method, press F2 (Store). For more information about naming and storing a method, see “Creating a Method” on page 5-6.

Methods and Users 5

Overview

About This Chapter

This chapter provides procedures for creating and editing a method whether it is simple or more complex. Procedures for adding and handling user names are also included.

In This Chapter

This chapter contains the following topics:

Topic	See Page
Adding, Changing, or Deleting a User Name	5-2
Creating a Method	5-6
Changing a Method Using Advanced Features	5-9
Handling Methods	5-18

Adding, Changing, or Deleting a User Name

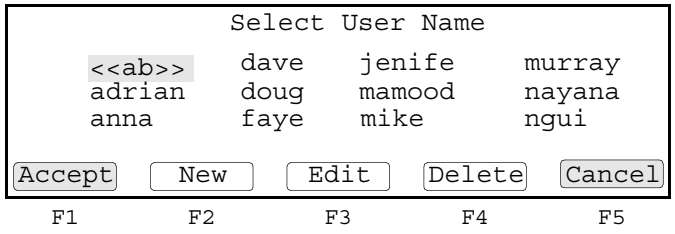
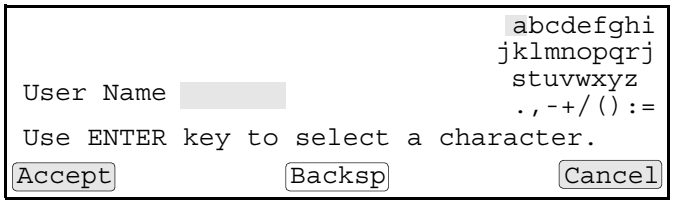
Introduction

On the GeneAmp® PCR System 2700, methods are stored by both method name and user name. It's important to have your own user name to keep your methods separate from those belonging to other users. Even if you are the only user of the system, you still need a user name.

A user name can be added, as well as changed or deleted. You can protect your user name by having a PIN number. When a PIN number has been created, only the person who knows the PIN number can change the user name. Additionally, once you have PIN, the system allows you to lock your methods. When your methods are locked, only the person who knows the PIN number can overwrite or delete them. Having a PIN number is optional, as is locking your methods.

Adding a User Name

To add a user:

Step	Action
1	From the Main Menu, press **F5** (User). The Select User Name screen appears. 
2	Press **F2** (New). The User Name screen appears. **Note** The blank space after the z is used to insert blank spaces. 

To add a user: *(continued)*

Step	Action

3	Spell the name by using the arrow keys to highlight the first letter of the name, then press **Enter**, then highlight the second letter, then press **Enter**, etc.
	
	When you have finished spelling the name (up to six characters), press **F1** (Accept).
	
	The Security Code screen appears.
	
	`User Name: hank  PIN number: None`
	`Protection: Unlocked`
	`Press PIN # to create a #. Then you set protection to Locked to prevent methods from being overwritten or deleted.`
	`Accept  Name  PIN#  Cancel`
	`F1  F2  F3  F4  F5`
	
	If you want to add a PIN number, continue with the next step. If not, press **F5** (Cancel) to return to the Select User Name screen, which now shows your newly added user name.

4	Press **F3** (PIN#).
	
	The Create a PIN Number screen appears.
	
	`Create a PIN Number`
	`Your PIN number protects the access to your user name and protection level`
	`Enter a PIN number.  New PIN #: XXXX`
	`Accept  Cancel`
	`F1  F2  F3  F4  F5`

5	Use the numeric keys to type a 4-digit PIN number, then press **F1** (Accept).
	
	The Confirm PIN Number screen appears.
	
	`Confirm PIN Number`
	`Your PIN number protects the access to your user name and protection level`
	`Enter a PIN number again. PIN #: XXXX`
	`Press Accept to confirm your PIN #.`
	`Accept  Cancel`
	`F1  F2  F3  F4  F5`

6	Retype the same 4-digit PIN number, then press **F1** (Accept).
	
	The Protection Status screen appears.
	
	`Username: hank  PIN number: XXXX`
	`Protection: Unlocked`
	`Press PIN # to create a #. Then you set protection to Locked to prevent methods from being overwritten or deleted.`
	`Accept  Name  PIN#  Lock  Cancel`
	`F1  F2  F3  F4  F5`

To add a user: *(continued)*

Step	Action
7	*Optional.* Notice that the Protection field is set to Unlocked. Press **F4** (Lock) to lock your methods. This toggles between a Locked and Unlocked state. Press **F1** (Accept) to accept the protection status displayed and return to the Select User Name screen.
8	Press **F1** (Accept) to return to the Main Menu.

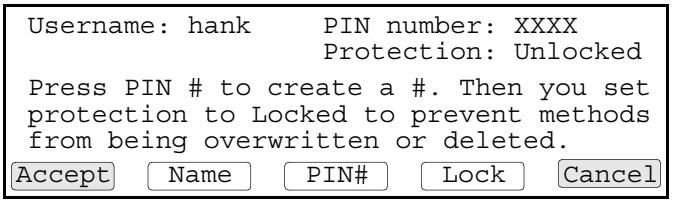
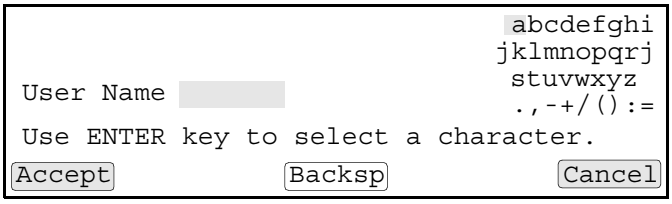
Changing a User Name

A user name can be changed. However, if a PIN number was assigned to the name, only the person who knows the PIN number can change the name.

To change a user name:

Step	Action
1	From the Main Menu, press **F5** (User). The Select User Name screen appears. Select User Name <<ab>> dave jenife murray adrian doug mamood nayana anna faye mike ngui Accept New Edit Delete Cancel F1 F2 F3 F4 F5
2	Highlight the user name you want, then press **F3** (Edit).
3	*Optional.* If the system has a PIN number for this user, the Security Check screen appears. Security Check To perform this action, you must enter your PIN #: Your PIN #: Accept Cancel F1 F2 F3 F4 F5 Type the PIN number, then press **F1** (Accept).

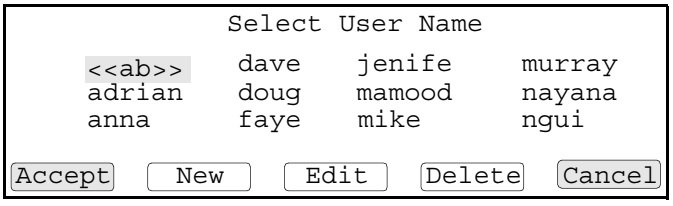
To change a user name: *(continued)*

Step	Action
4	When the following screen appears, function key F4 may or may not be active, depending on whether this user has a PIN number.  Press **F2** (Name). The User Name screen appears. 
5	Press the **CE** key to clear the previous name, then enter a new user name, as follows: Spell the name by using the arrow keys to highlight the first letter, then press **Enter**, then highlight the second letter, then press **Enter**, etc. When you have finished spelling the name (up to six characters), press **F1** (Accept). The Security Code screen appears again.
6	If you want to create a new PIN number, continue with step 4 of “Adding a User Name” on page 5-2. If not, press **F5** (Cancel) to return to the Select User Name screen, which shows the changed user name.

Deleting a User Name

You can delete a user name if there are no methods stored for that name.

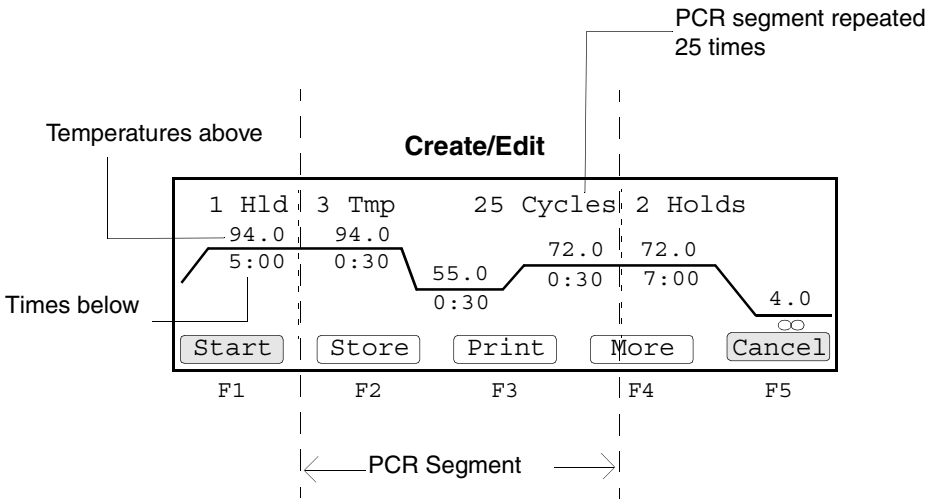
To delete a user name:

Step	Action
1	From the Main Menu, press **F5** (User). The Select User Name screen appears. 
2	Use the arrow keys to highlight the user name you want to delete, then press **F4** (Delete). The Select User Name screen is redisplayed minus the name you deleted.

Creating a Method

Introduction

A *method* is a set of instructions in which you specify how the instrument should heat and cool your samples in a PCR thermal profile. On the system 2700 a method is represented graphically, as shown below on the Create/Edit screen. the graph is the wavy line in the middle.



On the Create/Edit screen, temperatures are shown above the graph in degrees Celsius. Hold times in minutes and seconds are shown below the graph. The central portion of the screen, delineated by dashed lines, is the PCR segment. In this example, the PCR segment repeats 25 times. After PCR (in the post-PCR segment), the instrument holds the samples at 72 °C for 7 minutes, then cools to 4 °C and holds the samples at this temperature until you stop the run.

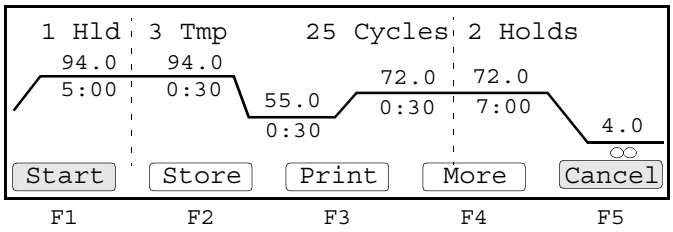
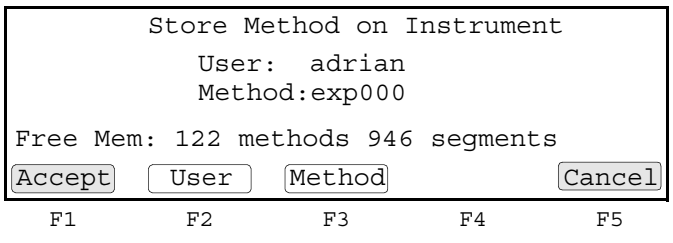
We call this the “Create/Edit screen” because it is the same screen with the same functions, whether you are creating a new method or editing an existing one. When you create a new method, the system provides a default method (shown above).

For an overview of the Create/Edit screen flow, see the chart on page D-4.

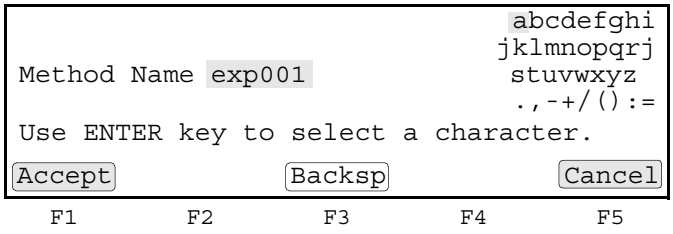
Before creating a method, you need to have added yourself as a user. You will be prompted for your user name when you attempt to store the method. For more information, see “Adding, Changing, or Deleting a User Name” on page 5-2.

Procedure

To create a method:

Step	Action
1	From the Main Menu, press **F2** (Create). The Create/Edit screen appears. 
2	Change times or temperatures or number of cycles by highlighting each parameter you want to change, typing in a new value with the numeric keys, then pressing **Enter**. **Parameter** / **Explanation** Temperature: The number above the graph in °C. Valid range is 4.0 °C to 99.9 °C. Time: The number below the graph in *min:sec* format. Valid range is 00.00 to 99:59; however, a value of 99:00 or greater creates a hold time of ∞ that lasts indefinitely. A hold time of ∞ can be used only as the final hold time on the graph (in the post-PCR portion). For more information, see “About Post-PCR Parameters” on page 5-8. Hold: Called Hld, Tmp, or Holds in the top line of the screen. This parameter determines the number of time/temperature segments in each portion of the graph delineated by dashed lines. In the pre-PCR portion, this value is usually 1. In the PCR portion (middle), 3 is typical for many PCR amplifications: template denaturation, primer annealing, and primer extension, although the valid range is 2–6. Cycles: The number of times you want the PCR portion (middle) of the graph to repeat. Valid range is 2–99. If the method you want to create is more complex that the one shown above, continue with the procedure and create and store a method as close to your ideal one as possible, then see “Changing a Method Using Advanced Features” on page 5-9.
3	When you have finished changing parameters, press **F2** (Store). The Store Method on Instrument screen appears. 

To create a method: *(continued)*

Step	Action
4	**Note** If you want to use the method name provided by the system (*e.g.*, exp000), skip to step 6. If you want to use a different name, press **F3** (Method) to display the Method Name screen. 
5	Press the **CE** key to clear the method name, then spell out the new name by highlighting the first letter, then pressing **Enter**, highlighting the second letter, then pressing **Enter**, etc. Numeric keys can be used as well. When you have finished spelling the name, press **F1** (Accept) to return to the Store Method on Instrument screen.
6	When the method name you want to use is displayed on the Store Method on Instrument screen, press **F1** (Accept). Your method is stored and you are returned to the Main Menu.

About Post-PCR Parameters

The post-PCR incubation temperature and hold time parameters define how to hold your samples at a specified temperature until you are ready to analyze them.

Note If the idle state setpoint, or the last hold of the method are below 15 °C, then the heated cover will automatically set to 50 °C

Typical Post-PCR Parameter Settings:

Temperature	Time (min:sec)	Use for
72 °C	7:00	Complete extension of all amplicons
72 °C	99:59 (×)	AmpErase® applications
4 °C	99:59 (×)	General storage

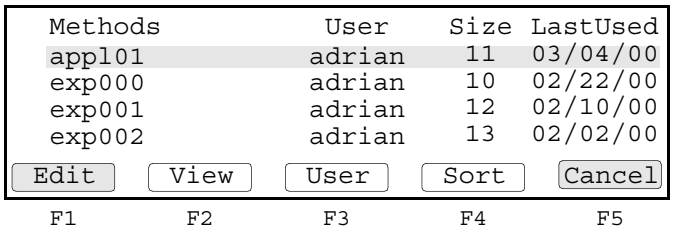
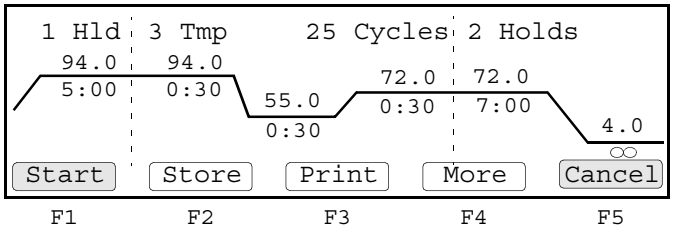
Changing a Method Using Advanced Features

Introduction

The previous section told you how to create and store a method. If you want to change a method or make a more complex method, the features described in this section will help.

Editing a Method

To edit an existing method:

Step	Action
1	From the Main Menu, press **F3** (Edit). The Stored Methods screen appears. 
2	Highlight the method you want to change, then press **F1** (Edit). The Create/Edit screen appears.  This screen is the same one that can be accessed by pressing **F2** (Create) from the Main Menu. Once you have reached this screen, you can perform the same functions, regardless of how you accessed it. From this screen you can:

Action	See Topic	Page
Change parameters displayed on this screen	Creating a Method	5-6
Use advanced features	Inserting a Hold	5-10
	Deleting a Hold	5-11
	Inserting a Cycle	5-12
	Inserting a Programmed Pause	5-14
	Editing a Programmed Pause	5-15
	Deleting a Programmed Pause	5-16
	Auto-Incrementing/ Decrementing Temperature Control Parameters	5-16
Store the method	Creating a Method	5-6

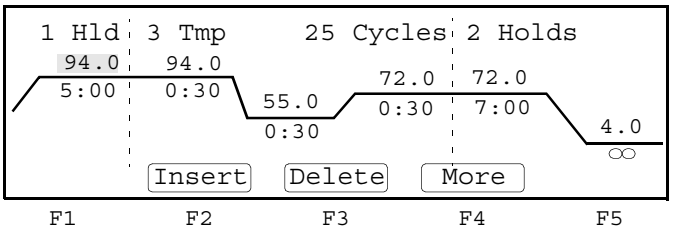
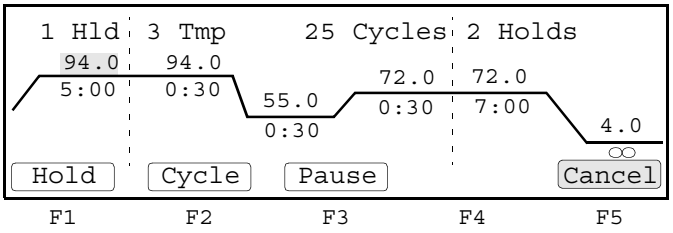
Inserting a Hold

A *hold* is a single time/temperature segment of a method, *e.g.*, samples are held at 94.0 °C for 5 minutes, 00 seconds (5:00).

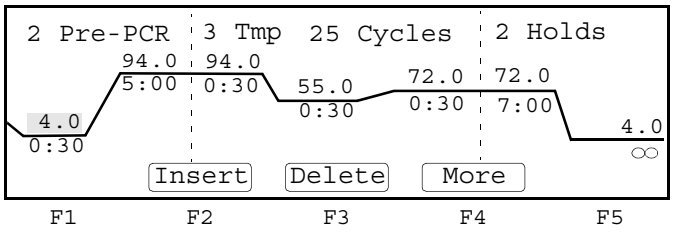
There are two ways you can insert a hold into a method:

- You can increment the value of the Hld, Tmp, or Holds fields on the Create/Edit screen, then press the Enter key. This adds a hold at the *far right* of the pre-PCR, PCR, or post-PCR segment, separated by dashed lines, respectively.
- You can use the procedure described below to insert a hold to the *left* of any segment.

To insert a hold:

Step	Action
1	From the Create/Edit screen, use the arrow keys to highlight a time or temperature parameter to the *left* of which you want to insert a hold.
2	Press **F4** (More). The Insert-Delete-More screen appears.  **Note** The Modify function (F1) also displays if the highlighted parameter was in the PCR segment.
3	Press **F2** (Insert). The Insert screen appears.  **Note** The Pause function will not display on the Insert screen if the highlighted segment already has a pre-programmed pause or if highlighter is not on a PCR segment parameter.

To insert a hold: *(continued)*

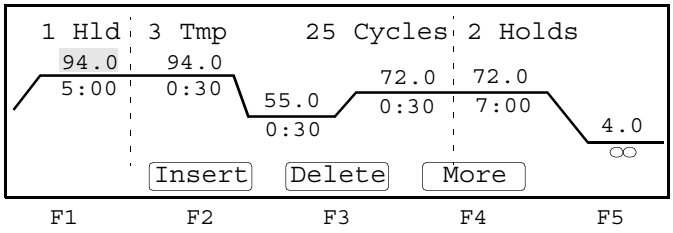
Step	Action
4	Press **F1** (Hold) The Insert-Delete-More screen appears showing the hold you added.  **Note** The Modify function (F1) also displays if the inserted hold was in the PCR segment.
5	Change the temperature and time of the new hold as necessary.
6	Press **F4** (More) to return to the Create/Edit screen.

Deleting a Hold

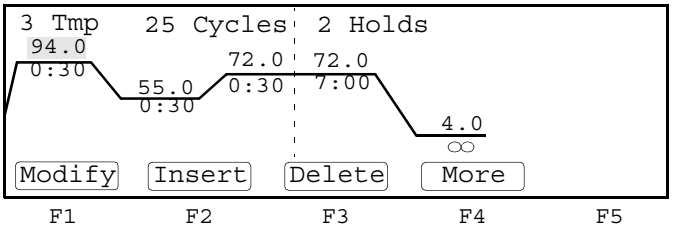
There are two ways to delete a hold:

- You can *decrement* the value of the Hld, Tmp, or Holds fields on the Create/Edit screen, then press Enter. This deletes a hold at the *far right* of the pre-PCR, PCR, or post-PCR segment, separated by dashed lines, respectively.
- You can use the procedure described below to delete a hold you highlight.

To delete a hold:

Step	Action
1	From the Create/Edit screen, use the arrow keys to highlight a time or temperature of a hold (segment) you want to delete.
2	Press **F4** (More). The Insert-Delete More screen appears.  **Note** The Modify function (F1) also displays if the highlighted parameter was in the PCR segment.

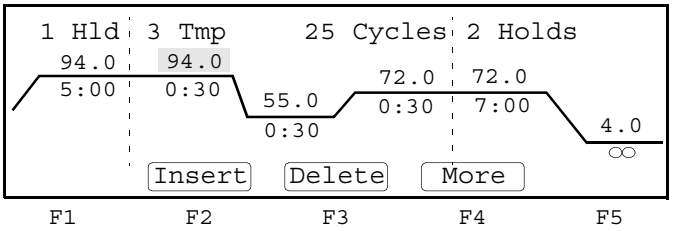
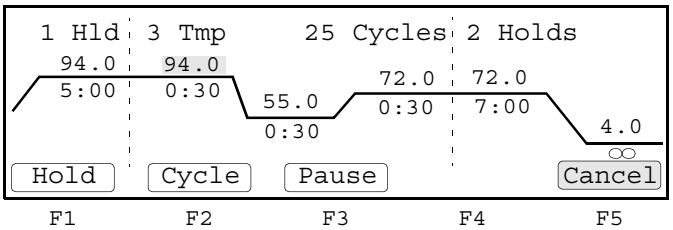
To delete a hold: *(continued)*

Step	Action
3	Press **F3** (Delete). The Insert-Delete-More screen redisplays minus the hold you deleted.  **Note** The Modify function (F1) also displays if the next highlighted parameter was in the PCR segment.
4	Press **F4** (More) to return to the Create/Edit screen.

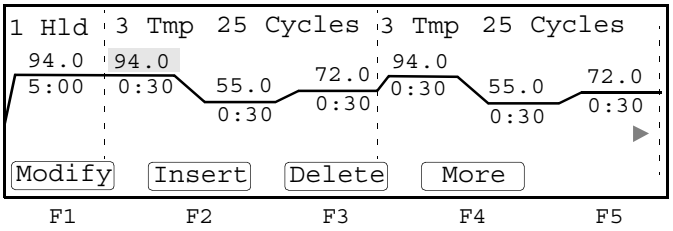
Inserting a Cycle

A *cycle* is a PCR portion of a method usually consisting of three time/temperature parameters and delineated by dashed lines. The instrument repeats these three temperatures and times for the number specified in the Cycles field (default is 25).

To insert a cycle:

Step	Action
1	From the Create/Edit screen, use the arrow keys to highlight a time or temperature parameter to the *left* of which you want to insert a cycle.
2	Press **F4** (More). The Insert-Delete-More screen appears.  **Note** The Modify function (F1)also displays if the highlighted parameter was in the PCR segment.
3	Press **F2** (Insert). The Insert screen appears.  **Note** The Pause function will not display on the Insert screen if the highlighted segment already has a pre-programmed pause or if highlighter is not on a PCR segment parameter.

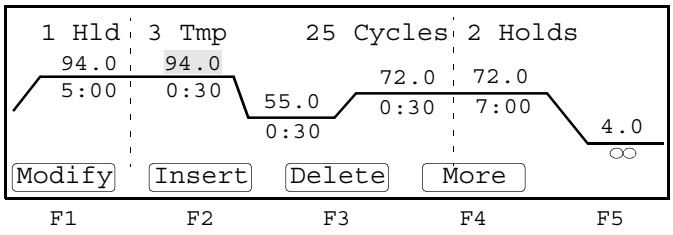
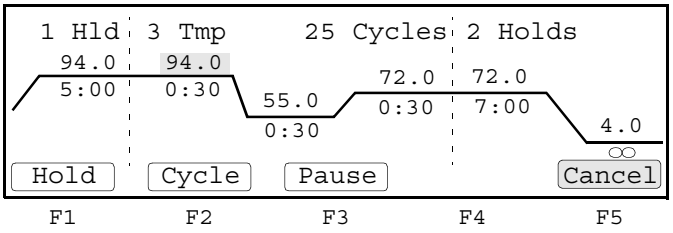
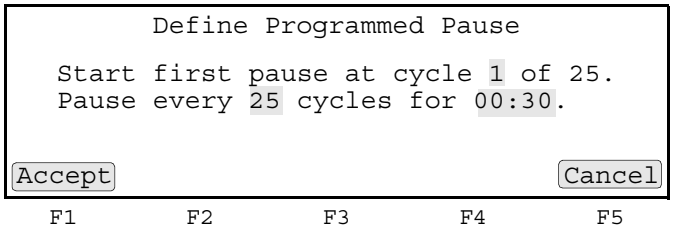
To insert a cycle: *(continued)*

Step	Action
4	Press **F2** (Cycle) The Modify screen appears showing the cycle (PCR segment) you added. 
5	Change the temperatures and times of the new cycle as necessary.
6	Press **F4** (More) to return to the Create/Edit screen. **Note** You can delete a cycle by entering **0** in the Tmp field, then pressing **Enter**.

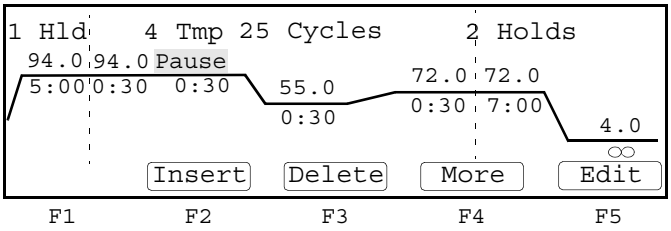
Inserting a Programmed Pause

A programmed pause is a point in the PCR portion of a method when cycling stops for a specified length of time. You define the frequency and length of the pause and the cycle at which it begins.

To insert a programmed pause:

Step	Action
1	From the Create/Edit screen, use the arrow keys to highlight a time or temperature parameter of the PCR segment during which you want to insert a programmed pause.
2	Press **F4** (More). The Modify screen appears. 
3	Press **F2** (Insert). The Insert screen appears. 
4	Press **F3** (Pause). The Define Programmed Pause screen appears.  The fields that can be changed are highlighted in the illustration here.
5	Type in the values you want to change. When you move the highlighter to No, the functions F2 (Yes) and F3 (No) become active. Press the appropriate key.

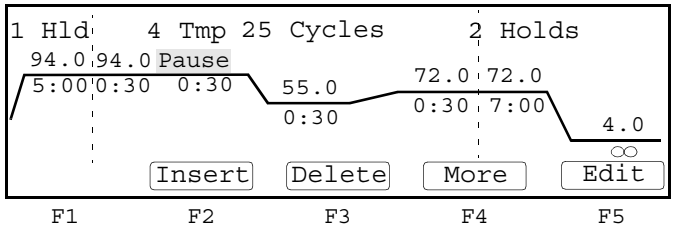
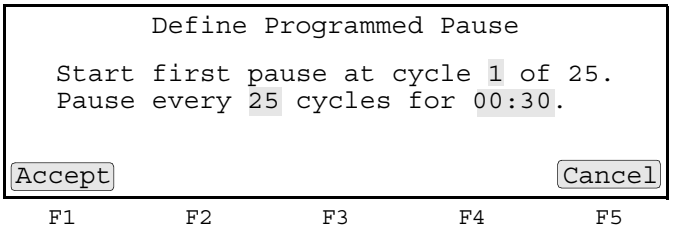
To insert a programmed pause: *(continued)*

Step	Action
6	Press **F2** (Accept). The Insert-Delete-More-Edit screen appears showing the programmed pause you inserted.  **Note** You can insert only one pause in each cycle.
7	Press **F4** (More) to return to the Create/Edit screen.

Editing a Programmed Pause

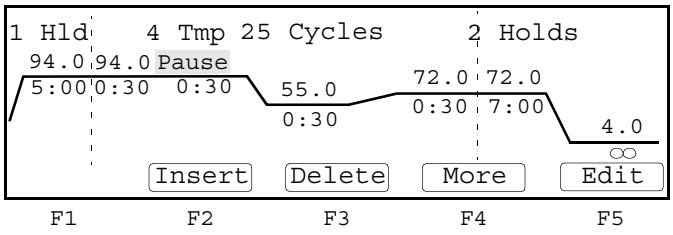
If you have inserted a programmed pause in the PCR portion of your method, you can edit the parameters of the pause at any time.

To edit a programmed pause:

Step	Action
1	From the Create/Edit screen, use the arrow keys to highlight the word Pause.
2	Press **F4** (More). The Insert-Delete-More-Edit screen appears. 
3	Press **F5** (Edit). The Defined Programmed Pause screen appears.  The fields that can be changed are highlighted in the illustration here.
4	Make your changes to any fields, then press **F1** (Accept) The Insert-Delete-More-Edit screen appears again.
5	Press **F4** (More) to return to the Create/Edit screen.

Deleting a Programmed Pause

To delete a programmed pause:

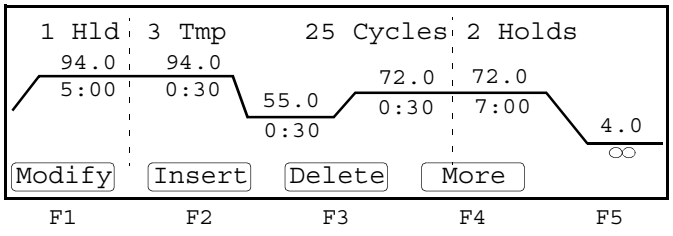
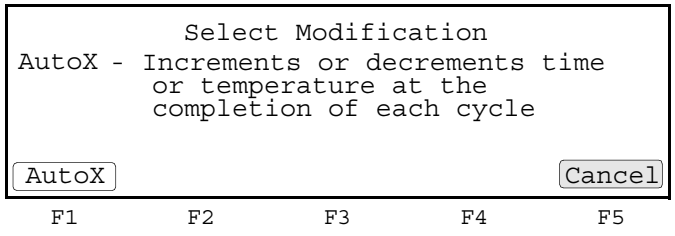
Step	Action
1	From the Create/Edit screen, use the arrow keys to highlight the word Pause.
2	Press **F4** (More). The Insert-Delete-More-Edit screen appears. 
3	Press **F3** (Delete). The Modify screen appears without the pause.
4	Press **F4** (More) to return to the Create/Edit screen.

Auto-Incrementing/ Decrementing Temperature Control Parameters

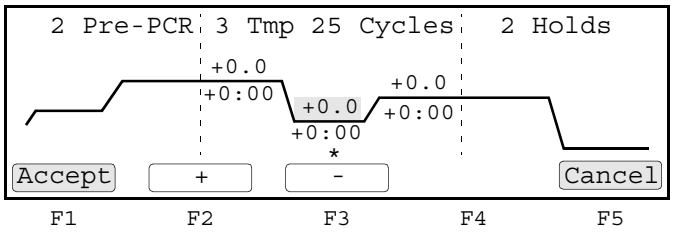
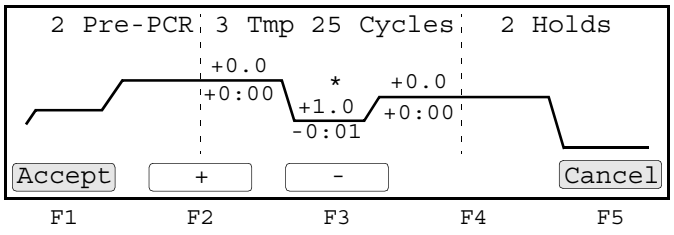
Using the AutoX function, you can automatically increase or decrease the value for any PCR segment parameter a fixed amount every cycle.

Note This feature is particularly useful towards the end of the amplification process since the amount of PCR product, available to be extended, increases with the number of cycles while the amount of available enzyme remains constant.

To automatically increase or decrease temperature control parameters:

Step	Action
1	Use the arrow keys from the Create/Edit screen to select a time or temperature parameter in the PCR segment.
2	Press **F4** (More**)**. The Modify screen appears. 
3	Press **F1** (Modify**)**. The Select Modification screen appears. 

To automatically increase or decrease temperature control parameters: *(continued)*

Step	Action
4	Press **F1** (AutoX). The AutoX screen appears. 
Note If you have inserted a programmed pause, the AutoX screen displays the pause, but you cannot modify it from the AutoX screen.	
5	Highlight the PCR time or temperature parameter that you want modified when you run your method. **Note** From the AutoX screen, you cannot modify the number of parameters in each segment or the number of cycles.
6	Use the numeric keypad to change numeric values. Press **F2** (+) or **F3** (-) to change the plus or minus signs. The selected sign displays in the current field. After you press **Enter** or an arrow key, an asterisk (*) appears for parameters that have been modified. 
7	Press **F1** (Accept**)** to accept all entries on the AutoX screen and return to the Modify screen.
8	Press **F4** (More) to return to the Create/Edit screen.

Handling Methods

Introduction

In this section we describe how to select a method, view method parameters, sort methods, search for a method, and print and delete a method.

Predefined Methods

The system 2700 supplies five predefined methods that you can run:

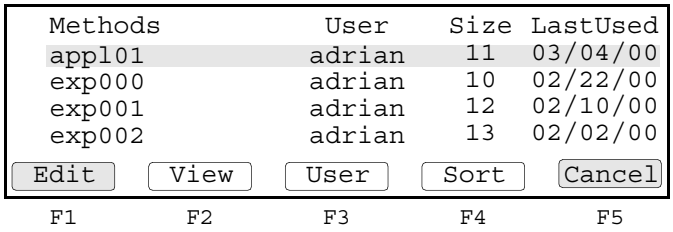
- AmpliTaq Gold®
- BigDye™ Terminator
- General PCR
- Time Release PCR
- Touchdown PCR

Each of these methods is stored under the user name <<ab>>. You can edit these methods and store them under a different name, a different user name, or select any one and run it. For more information about these methods, see Appendix C, “Supplied Methods.”

Selecting a Method

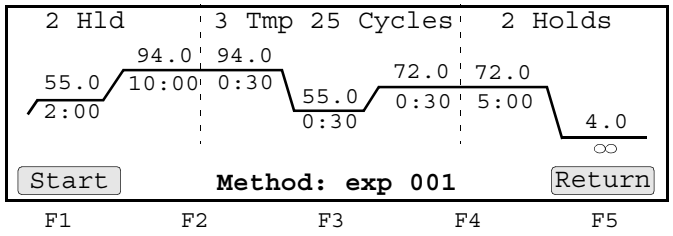
If the method you want to run has already been created and stored, you can select it from a list. If the method you want to run has not been created, see “Creating a Method” on page 5-6.

To select a method:

Step	Action
1	Access the Stored Methods screen. Most frequently you do this by pressing **F2** (Run) or **F3** (Edit) from the Main Menu. The Stored Methods screen appears.  **About This Screen** The top line of the display continuously cycles between the following three lines: ♦ Methods User Size Stored – Stored represents the date the method was last saved. In the appropriate case, this column designates the date last used. – The units for the Size field are based on a calculation of the complexity and length of a method relative to a maximum size of 1102 size segments for the storage capacity of the instrument. ♦ Used Mem: xxx methods xxx segments – The Used Mem field displays the number of size segments used by all stored methods. ♦ Free Mem: xxx methods xxx segments – The Free Mem field displays the number of size segments available to store created methods.
2	If you need help deciding which method to select, you can: ♦ View method parameters ♦ Sort methods by different categories ♦ Search for a method by user name Each of these topics is discussed later in this section.
3	Select a method by using the up and down arrow keys to move the highlighter to a method listed on the Stored Methods screen. **Note** You can use the up and down arrow keys as repeat keys for quick scrolling.
4	Press **F1** to continue the function you began.

Viewing Method Parameters

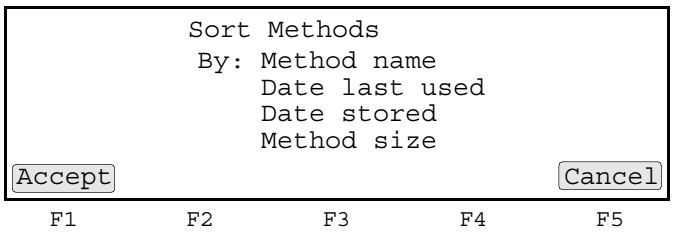
To view the parameters of a method before running it:

Step	Action
1	Press **F2** (View) from the Stored Methods screen. The View Method screen appears. The screen shows all the parameters of the method you selected. 
2	After reviewing PCR and post-PCR parameters of a stored method, you can: ♦ Press **F1** (Start) to start the method. ♦ Press **F5** (Return) and return to the Stored Methods screen. You cannot edit parameters from the View Method screen.

Sorting Methods

If you have a large number of stored methods, you can sort them by name, date last used, date stored, and size.

To sort methods:

Step	Action
1	Press **F4** (Sort) from the Stored Methods screen. The Sort Methods screen appears. 

To sort methods:

Step	Action
2	Use the up and down arrow keys to select the type of sort. The following table describes the sort methods.

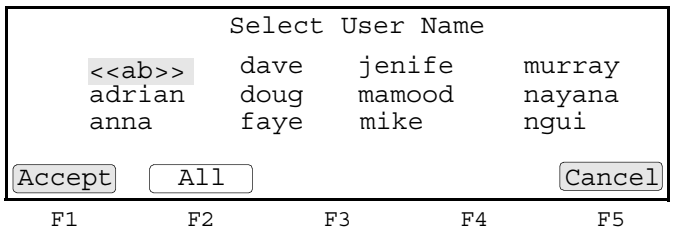
Choose this item...	To sort methods...
Method name	alphabetically.
Date last used	chronologically in descending order by date of use. The last method which ran or was stored is listed first.
Date stored **Note** Uses the most recent title and date, between date last used and the date stored.	chronologically by date stored. The last method stored is listed first.
Method size	in increasing order by the amount of memory used to store each method. The largest size method is listed first.

3	Press **F1** (Accept) to accept a selection. This returns you to the Stored Methods screen where the displayed methods are sorted according to your selection in step 2.

Searching for Methods

You can find any method that has been stored under a user name.

To search for a method:

Step	Action
1	Press **F3** (User) from the Stored Methods screen. The Select User Name screen appears. 
2	From this screen you can: ♦ Press **F2** (All) to list all the methods currently stored on the instrument. ♦ Press **F1** (Accept) to display the methods stored under the highlighted name.
3	Making a selection returns you to the Stored Methods screen which now displays the methods of the user you selected.

Printing a Method

If you have a printer connected to your instrument and have configured your instrument for it, you can print a record of the parameters in a method. For more information see “Configuring the Instrument” on page 6-2.

To print a method:

Step	Action
1	From the Create/Edit screen, press **F3** (Print). This prints a copy of the parameters for the method displayed on the screen.

Deleting a Method

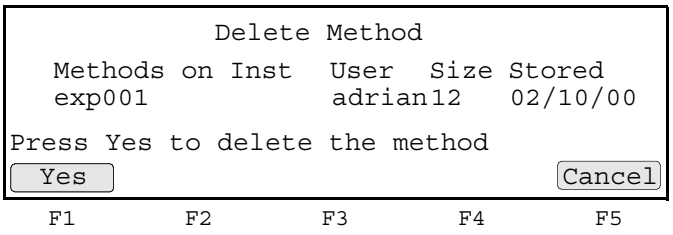
To delete a method:

Step	Action
1	From the Main Menu press **F4** (Util). The Utilities 1 screen appears. Utilities Diag - Instrument diagnostics TmCalc - Calculates melting temp Config - Instrument configuration [Diag] [TmCalc] [Config] [More] [Exit] F1 F2 F3 F4 F5
2	Press **F4** (More) The Utilities 2 screen appears. Utilities Delete - Delete a Method Hist - Display history of last run [Delete] [Hist] [More] [Exit] F1 F2 F3 F4 F5
3	Press **F1** (Delete). The Stored Methods screen appears. Methods User Size LastUsed appl01 adrian 11 03/04/00 exp000 adrian 10 02/22/00 exp001 adrian 12 02/10/00 exp002 adrian 13 02/02/00 [Delete] [View] [User] [Sort] [Cancel] F1 F2 F3 F4 F5

To delete a method: *(continued)*

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>4</td><td>Use the arrow keys to highlight the method you want to delete, then press F1 (Delete).

The Delete Method screen appears.

 
</td></tr>
<tr><td>5</td><td>Press F1 (Yes) to delete the method.

<table>
<tr><th>If the method was...</th><th>Then...</th></tr>
<tr><td>Unlocked</td><td>the method is deleted.</td></tr>
<tr><td>Locked</td><td>the Security Check screen appears.

Type the PIN number, then press F1 (Accept). The Delete Method screen appears.

Press F1 (Yes) to delete the method.</td></tr>
</table>
After the method is deleted, the Stored Methods screen appears.

Note Even after you delete the last method stored under a user name, the name is not removed from the instrument. To delete the name, see “Deleting a User Name” on page 5-5.</td></tr>
</table>

6 *Utilities*

Overview

About This Chapter

This chapter provides information about almost all functions that can be performed from the Util (Utilities) selection on the Main Menu.

In This Chapter

This chapter contains the following topics:

Topic	See Page
Configuring the Instrument	6-2
Upgrading System Firmware	6-4
Connecting to a Printer	6-5
Calculating the Melting Temperature	6-6
Running Hardware Diagnostics	6-7
Running the Calibration Verification Test	6-9
Running the Temperature Non-Uniformity Test	6-9
Running System Performance Diagnostics	6-10

Configuring the Instrument

Overview There are about six parameters or features you can enable or disable on the GeneAmp® System 2700. These six fields are spread across two configuration screens. Pressing F4 (More) takes you from screen to screen in a circle.

Procedure To configure the instrument:

Step	Action

1	From the Main Menu, press **F4** (Util).
	
	The Utilities 1 screen appears.
	
	`Utilities`
	
	`Diag - Instrument diagnostics`
	`TmCalc - Calculates melting temp`
	`Config - Instrument configuration`
	
	`[Diag] [TmCalc] [Config] [More] [Exit]`
	`F1 F2 F3 F4 F5`

2	Press **F3** (Config).
	
	The Configuration 1 screen appears. You can press **F4** (More) to cycle from one configuration screen to the next.
	
	`Instrument Configuration`
	
	`Time: 11:30 AM`
	`Date: 03/01/00 M/D/Y`
	`Run Time Printer: Off`
	
	`[Accept] [PM] [24Hr] [More] [Cancel]`
	`F1 F2 F3 F4 F5`
	
	`Instrument Configuration`
	
	`Pause Time Out: 10:00 (00:01-99:59)`
	`Idle State Setpoint: 25.0°C (4.0-99.9)`
	`Baud Rate: 9600`
	
	`[Accept] [More] [Cancel]`
	`F1 F2 F3 F4 F5`

3	On each configuration screen you can:

Action	Explanation
Change field values	Use arrow keys to highlight the value of the appropriate field, then see “Parameters” below.
Press F1 (Accept)	This stores your entries and returns to the Utilities 1 screen.
Press F4 (More)	This displays the next configuration screen.
Press F5 (Cancel)	This returns to the Utilities 1 screen without saving.

Parameters

Below are parameters that are used on the configuration screens.

<table>
<tr><th>Field</th><th>Explanation</th></tr>
<tr><td>Time</td><td>Use the numeric keys to enter the time. Choose AM, PM, or 24-Hour using the function keys.</td></tr>
<tr><td>Date</td><td>Use the numeric keys to change the date. Choose M/D/Y, D/M/Y, or Y/M/D format for month, day, and year, using the function keys.</td></tr>
<tr><td>Run Time Printer</td><td>Choose On or Off using the function keys. Enabling the printer allows you to print method parameters or records of run time events directly from the display screen. See “Connecting to a Printer” on page 6-5.</td></tr>
<tr><td>Pause Time Out</td><td>Use the numeric keys to enter the minutes:seconds in the range shown on the configuration screen. This field sets the length of time the instrument pauses when you press F1 (Pause) or the Stop key from the Run Time screen. See “Pausing or Stopping a Run” on page 4-9.</td></tr>
<tr><td>Idle State Setpoint</td><td>Use the numeric keys to type a temperature in the range shown on the configuration screen. This value is the temperature at which the instrument will remain when powered up but idle.

IMPORTANT After a run is completed or terminated, there is approximately a 30-second delay before the instrument attains the specified idle state temperature. This allows you to stop one method and start another before the instrument temperature changes.</td></tr>
<tr><td>Baud Rate</td><td>Use the function keys Up and Down to choose a baud rate. Values are 38400, 19200, 9600, 4800, 2400, 1200, and 600.

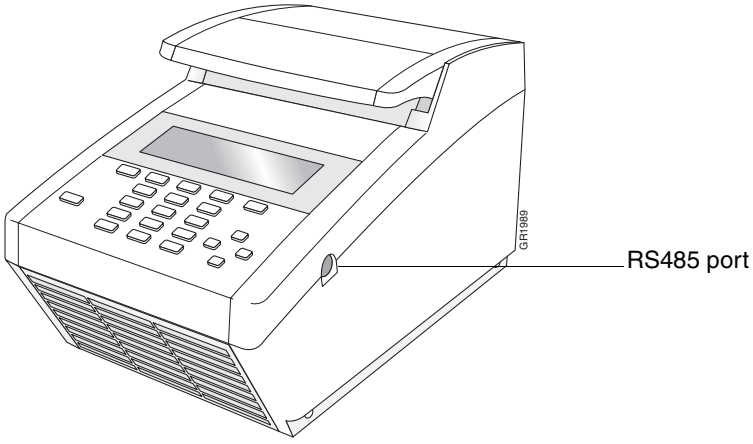
This value is the rate at which the instrument transmits data through the printer port and serial port.
<table>
<tr><th>Item</th><th>Value</th></tr>
<tr><td>Baud Rate</td><td>9600</td></tr>
<tr><td>Parity</td><td>NONE</td></tr>
<tr><td>Data Bits</td><td>8</td></tr>
<tr><td>Stop Bits</td><td>1</td></tr>
</table>
</td></tr>
</table>

Upgrading System Firmware

About the Upgrade

When a new version of system firmware becomes available, you can download it from our Web site, http://www.appliedbiosystems.com/2700. Instructions for performing the upgrade will also be posted on the Web site.

In order to perform the upgrade, you will need to connect a PC communication cable P/N N805-1327 to the RS485 port on the side of the system 2700 (shown below) to a serial port on a MIcrosoft® Windows®-based computer that has Internet access.



Connecting to a Printer

Introduction

If you elect to connect an optional printer to your system 2700, you can print out a hard copy of the time and temperature parameters for PCR methods you create.

Specifications

You can connect the system 2700 to any printer with a serial (RS-232C) interface board and the following specifications:

Baud Rate	9600
Parity	NONE
Data Bits	8
Stop Bits	1

Cable Connections

Connect one end of your Applied Biosystems (N805-1326) printer cable to the RS-485 serial port on the side panel of the system 2700 and connect the other end to the serial adapter card port on the rear panel of the printer.

Installing a Printer

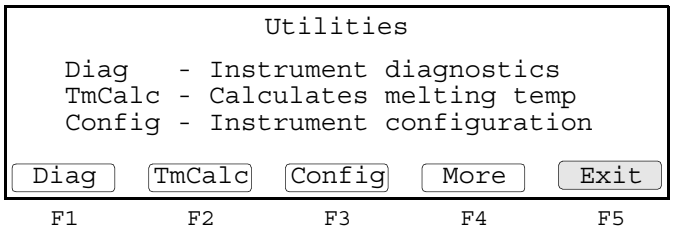
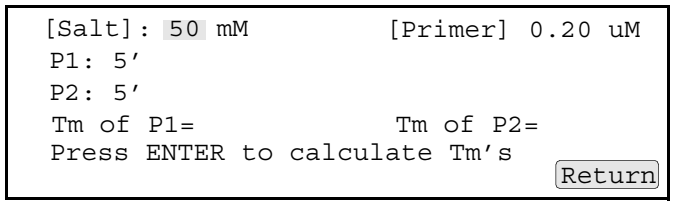
See your printer manual for instructions on how to connect the printer cable to your printer and complete any other necessary installation steps.

After you have conncted the printer cable and installed the printer, you must configure the instrument for the printer. See “Configuring the Instrument” on page 6-2.

Calculating the Melting Temperature

Procedure Use the T_m Calculator to determine the denaturation temperature of a primer set of known sequence.

To calculate the melting temperature:

Step	Action
1	Press **F4** (Util) from the Main Menu. The Utilities 1 screen appears. 
2	Press **F2** (TmCalc). The T_m Calculator appears. 
3	Enter the salt concentration. The default is 50. Enter values 5 to 1000.
4	Enter the primer concentration. The default is 0.20. Enter values 0.01 to 10.00.
5	Enter primer sequence in P1 using the function keys for A, C, G, or T.
6	Enter primer sequence in P2 and press **Enter** to calculate the T_ms. The melting points are displayed. Use this information to program a run. For more information, see Chapter 5, "Methods and Users."
7	Press **F5** (Return) to display the Utilities 1 screen.

Running Hardware Diagnostics

Overview

The system 2700 allows you to perform two hardware diagnostic tests:

- Visually determine if the Liquid Crystal Display (LCD) screen is functioning properly
- Verify the operation of the keypad

Both tests are performed from the Hardware Diagnostics screen.

```
          Hardware Diagnostics
  Disp      - LCD Display Diagnostic
  Keypad    - Keypad Diagnostic


 Disp    Keypad                          Exit
   F1       F2        F3        F4        F5
```

Testing the Display Screen

The Display diagnostic test allows you to visually determine if the display screen is properly functioning by turning on and off all the LCD pixels.

To test the display screen:

Step	Action

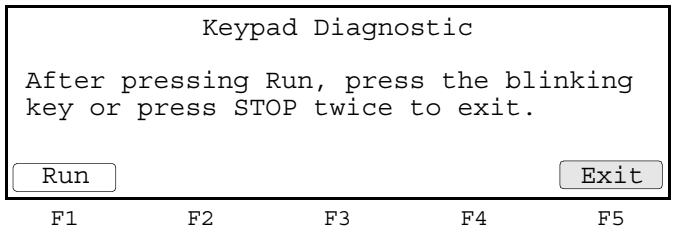
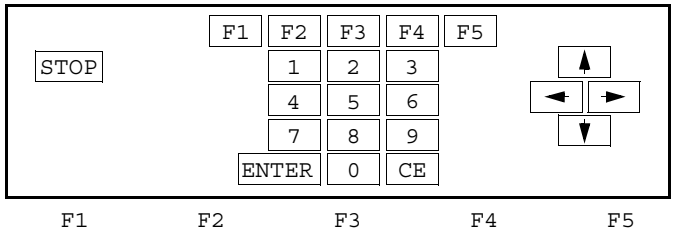
1	Access the Display Diagnostics screen.
	a. From the Main Menu press **F4** (Util) to access the Utilities 1 screen.
	b. Press **F1** (Diag) to display the Diagnostics screen.
	c. Press **F1** (Hard) to display the Hardware Diagnostics screen.
	d. Press **F1** (Disp).
	The Display Diagnostics screen appears.
	`Display Diagnostics`
	`1. Read all instructions first.`
	`2. Press Run to turn ON all pixels.`
	`3. Press STOP to turn OFF all pixels.`
	`4. Press STOP to exit.`
	`Run  Exit`
	`F1 F2 F3 F4 F5`

2	Read and perform the instructions on the screen.

Testing the Keypad

Use the keypad diagnostic test to verify that all 22 keys on the control panel are functioning properly.

To test the keypad:

Step	Action
1	Access the Keypad Diagnostics screen. a. From the Main Menu press **F4** (Util) to access the Utilities 1 screen. b. Press **F1** (Diag) to display the Diagnostics screen. c. Press **F1** (Hard) to display the Hardware Diagnostics screen. d. Press **F2** (Keypad). The Keypad Diagnostic screen appears. 
2	Press **F1** (Run). The Control Panel screen appears. 
3	Press each indicated flashing key. After you have pressed each key in order, the test ends, and the Hardware Diagnostics screen appears.

Running the Calibration Verification Test

Why Use This Test? Use this test to verify the temperature calibration of your system 2700.

Equipment Required This test requires the 0.2-mL Temperature Verification System (P/N 4317939) for 96-well thermal cyclers.

For more information on performing the test, refer to the instructions included with your Temperature Verification System. Follow the procedure for the GeneAmp® PCR System 9700.

Running the Temperature Non-Uniformity Test

Why Use This Test? Use this test to verify the temperature non-uniformity of the sample block in the system 2700.

Equipment Required This test requires the 0.2-mL Temperature Verification System (P/N 4317939) for 96-well thermal cyclers.

For more information on performing the test, refer to the instructions included with your Temperature Verification System. Follow the procedure for the GeneAmp® PCR System 9700.

Running System Performance Diagnostics

Overview

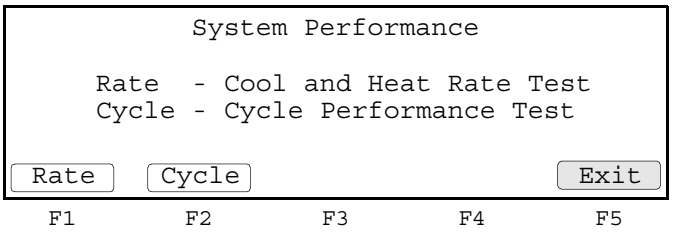
After you have configured the system 2700, conduct the system performance tests to verify the integrity of the cooling and heating system.

There are two system performance tests:

- Rate Test
- Cycle Test

IMPORTANT Before you begin these tests, make sure that you place an empty 96-well plate with full plate cover on the sample block (or use an empty tray and cover the wells with caps or the full plate cover). Close the heated cover, and pull the lever down.

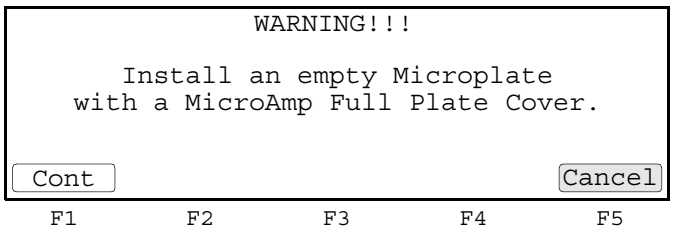
Both of these tests are performed from the System Performance screen.



Running the Rate Test

Use the Rate Test to verify that the Peltier units are operating correctly. The test takes approximately two minutes to run.

To run the Rate Test:

Step	Action
1	Access the Warning screen. a. From the Main Menu press **F4** (Util) to access the Utilities 1 screen. b. Press **F1** (Diag) to display the Diagnostics screen. c. Press **F2** (System) to display the System Performance screen. d. Press **F1** (Rate). The Warning screen appears. 
2	After you have installed a plate and cover, press **F1** (Cont). The instrument then runs through a series of tests where the sample block is stabilized at 35 °C, 94 °C, and 4 °C.

To run the Rate Test: *(continued)*

Step	Action
3	At the conclusion of the test, the Cool and Heat Rate Test screen appears. The screen displays the test results and whether the test results passed or failed. Cool and Heat Rate Test Pass Heating rate: x.xx °C/s Cooling rate: x.xx °C/s Print Cancel F1 F2 F3 F4 F5 The following table lists the passing ranges for the Rate Test. Heating Rate: > 1.25 °C /second Cooling Rate: > 1.55 °C /second

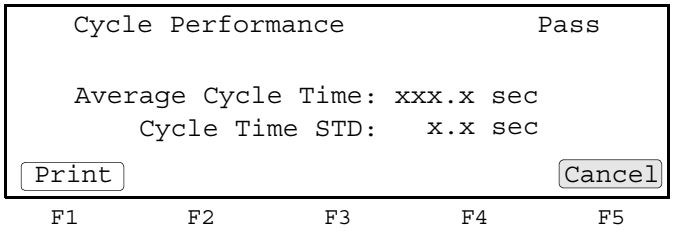
Running the Cycle Test

Use the Cycle Test to verify that the PCR cycling function operates properly. This test takes approximately 15 minutes to run.

To run the Cycle Test:

Step	Action
1	Access the Warning screen. a. From the Main Menu press **F4** (Util) to access the Utilities 1 screen. b. Press **F1** (Diag) to display the Diagnostics screen. c. Press **F2** (System) to display the System Performance screen. d. Press **F2** (Cycle). The Warning screen appears. WARNING!!! Install an empty Microplate with a MicroAmp Full Plate Cover. Cont Cancel F1 F2 F3 F4 F5
2	After you have installed a plate cover, press **F1** (Cont). The Cycle Test executes a standard PCR cycling reaction, measures, and reports the average cycle time, and the cycle to cycle variation.
Note Pressing Pause during the Cycle Test may generate false test results. Re-run the Cycle Test if Pause was pressed during the test.	

To run the Cycle Test: *(continued)*

Step	Action
3	At the conclusion of the test, the display indicates test results and whether the test results passed or failed.  The following table lists the passing ranges for the Cycle Test. Average Cycle Time: <= 129 sec Cycle Time STD: <=1.0 sec

7 Maintenance

Overview

About This Chapter

This chapter provides procedures for maintaining your GeneAmp® PCR System 2700.

⚠ WARNING Do not remove the instrument cover. There are no components inside the system 2700 that you can safely service yourself. If you suspect a problem, refer to our Web site,
http://www.appliedbiosystems.com/2700

In This Chapter

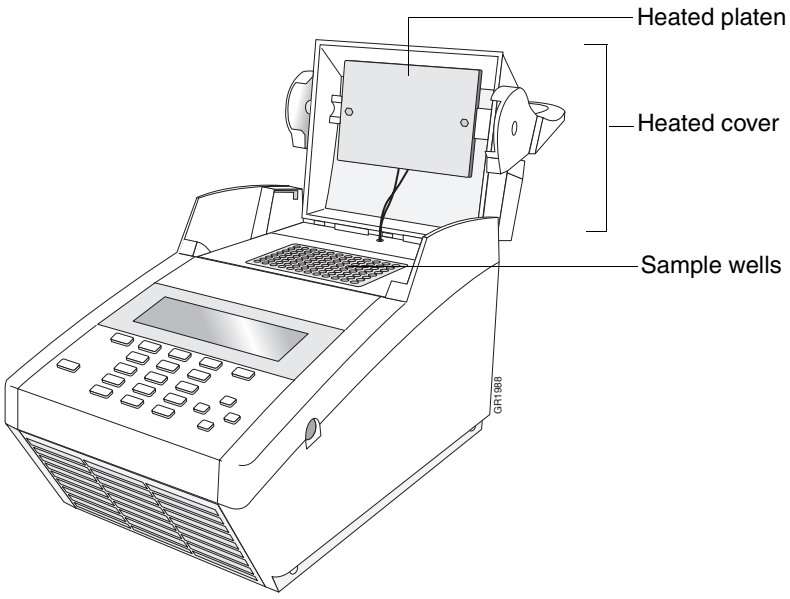
This chapter contains the following topics:

Topic	See Page
Cleaning the Instrument	7-2
Replacing Fuses	7-4

Cleaning the Instrument

Preparation

To clean the sample wells, raise the lid. The cleaning position is shown below.



Cleaning the Sample Wells

If you use any cleaning or decontamination method, except those recommended in the manual, you risk damaging the equipment. Clean the sample wells once a month or as needed.

To clean the sample wells:

Step	Action
1	If a method is running, press the **Stop** key twice.
2	Turn off the instrument.
3	Wait 1 minute for the block to cool.
4	Lift the lever and open the hinged heated cover.
5	Remove the sample tray from the block and set it aside.
6	Use a cotton swab soaked in pure isopropanol to clean the sample wells thoroughly. **⚠WARNING CHEMICAL HAZARD**. **Isopropanol** is a flammable liquid and vapor. It may cause eye, skin, and upper respiratory tract irritation. Prolonged or repeated contact may dry skin and cause irritation. It may cause central nervous system effects such as drowsiness, dizziness, and headache, etc. Please read the MSDS, and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves.

To clean the sample wells: *(continued)*

Step	Action
7	Remove any remaining isopropanol from the cover before reloading the sample tray. **Note** If the sample wells become contaminated from the samples, clean the wells thoroughly with a cotton swab soaked in bleach and then rinse with water. **⚠ WARNING CHEMICAL HAZARD. Sodium hypochlorite (bleach)** is a liquid disinfectant that can be corrosive to the skin and can cause skin depigmentation. Please read the MSDS, and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves.

Cleaning the Heated Cover

⚠ WARNING During instrument operation, the temperature of the heated cover can be as high as 108 °C, and the temperature of the sample block can be as high as 100 °C. Before performing the procedure, wait until the heated cover and sample block reach room temperature.

To clean the heated cover:

Step	Action
1	If a method is running, press the **Stop** key twice.
2	Turn off the instrument.
3	Wait 20 to 30 minutes for the heated cover to cool down.
4	Lift the lever and open the hinged heated cover.
5	Soak a cotton swab or piece of clean cloth with pure isopropanol and gently wipe the heated platen. **⚠ WARNING CHEMICAL HAZARD. Isopropanol** is a flammable liquid and vapor. It may cause eye, skin, and upper respiratory tract irritation. Prolonged or repeated contact may dry skin and cause irritation. It may cause central nervous system effects such as drowsiness, dizziness, and headache, etc. Please read the MSDS, and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves.
6	Remove any remaining isopropanol from the cover. **Note** If the platen becomes contaminated with amplified DNA, then raise the heated cover to the cleaning position, and wipe the platen with a cloth or cotton swab soaked in bleach and then rinse with water. **⚠ WARNING CHEMICAL HAZARD. Sodium hypochlorite (bleach)** is a liquid disinfectant that can be corrosive to the skin and can cause skin depigmentation. Please read the MSDS, and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves. **Note** Clean the heated platen once a month or as needed.

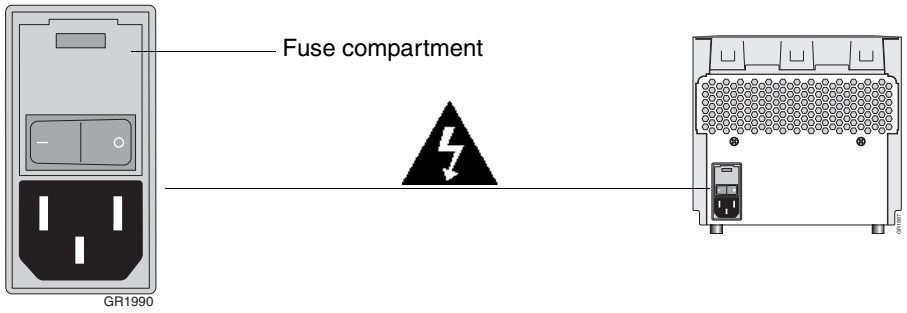
Replacing Fuses

Introduction

All instruments have factory-installed fuses. If you need to change the fuses, use the procedure below.

⚠ WARNING FIRE HAZARD. For continued protection against the risk of fire, replace fuses only with Listed and Certified fuses of the same type and rating as those currently in the instrument.

The fuse compartment is located at the instrument rear, as shown below.

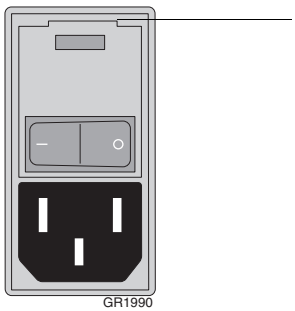


Items Needed

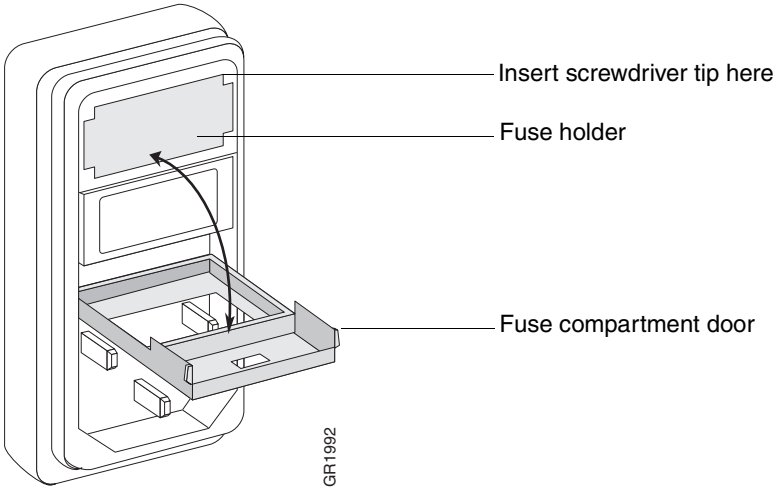
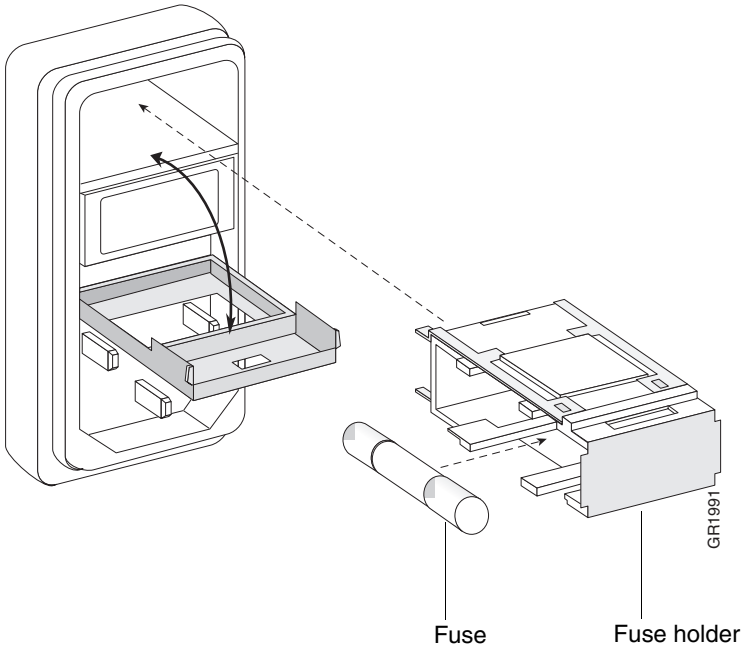
- Two fuses of the same type you are removing
- Fine flat-tip screwdriver

Procedure

To replace the fuses:

Step	Action
1	Turn off the system 2700 and disconnect the power cord from the instrument rear. **⚠ WARNING ELECTRIC SHOCK HAZARD.** Disconnect the power cord before opening fuse compartment. Wait 30 seconds before any further work to let any electrical charges dissipate.
2	Insert the screwdriver tip at the top edge of the fuse compartment door and pry it open.  The door opens to reveal the red fuse holder.

To replace the fuses: *(continued)*

Step	Action
3	Insert the screwdriver tip at the edges of the red fuse holder and gently remove it from the instrument. 
4	Remove the two fuses from the fuse holder and replace them with two of the same type. 
5	Return the fuse holder to the instrument, and close the fuse compartment door. Press it until it locks into place.
6	Connect the instrument power cord.

8 Troubleshooting

Overview

About This Chapter This chapter explains how to solve instrument problems.

In This Chapter This chapter contains the following topics:

Topic	See Page
If There's a Power Failure	8-2
Display Screen Error Messages	8-3
Troubleshooting Information	8-6

If There's a Power Failure

Automated Restart Function

An automated restart function allows for power outages and safe continuation of a PCR run after resumption of power.

If Power Is Interrupted

The instrument does the following in a power failure:

1. Restarts or continues the PCR experiment.

   The instrument determines what temperature was being approached, or was holding.

   Upon resumption of power, it will go to that temperature and count down the time remaining in the hold as soon as the temperature is within the specified clock start limit.

2. Incubates the samples until such time as the experiment can be continued.

3. Enters a record for any power outage in the history file.

Display Screen Error Messages

User Input Error Messages

The following table lists user input error messages, a description of the message, and recommended action.

Message	Description	Recommended Action
Can only enter an infinity hold at end	A method can only have a Hold segment with an infinity hold as the last segment in a method. This message occurs when you try to enter an infinity hold segment in the middle of a method.	Assign finite time segments to holds within a method.
Delete your methods first	User tried to delete a user name that has methods stored under it.	Delete or transfer the associated methods before deleting a user name.
Enter a name or CANCEL	You did not enter at least one character on the User Name screen before pressing the Accept key.	Enter the user name to which the desired method is assigned.
Enter oligo sequence	Incomplete TmCalc data.	Enter a value in the P1 and P2 fields of the TmCalc.
Enter user and method names or CANCEL	You did not enter a user name and a method name before storing a method.	Specify the method name and choose a user to store a method.
Field is full	You tried to enter more data in a field than the field size allows.	Reenter data within the specifications of the field.
Infinity hold not allowed in cycle	A method can have an infinity hold segment as the last segment in the method. This message occurs when you tried to enter an infinity time in a cycle segment.	Use finite values for cycle segments within the method.
Invalid password/pin#	You entered an incorrect PIN#.	Enter the correct PIN#.
List of user names is full	The maximum number of users has been entered into the system.	Delete unused user names.
Maximum of 6 segments allowed	You tried to insert more than six temperature control parameters into a hold or cycle.	Do not assign more than six hold or cycle parameters to a method.
Method battery RAM initialized	Stored methods have been reset due to hardware or software failure. Not all methods may be lost.	Check method directory. Refer to our Web site.[a]
Method requires at least one segment	You deleted all temperature control parameters in a method. A method must have at least one time and temperature parameter.	Review and correct the method to include the temperature parameter(s).
No seconds in time field	You did not include seconds in the time field.	Include seconds when entering the time.
Not enough method memory left	This error occurs: ♦ When you attempt to exceed the limit of 137 methods. ♦ When you attempt to store or create a new method that is larger than the available storage space.	♦ Determine how much storage memory is available on the instrument. ♦ Delete or store rarely used methods elsewhere.

Message	Description	Recommended Action
Not implemented yet	The feature is not implemented in the current firmware version.	Upgrade firmware when the new version is available from Applied Biosystems.
Printer not responding	The printer has been disconnected or is off line.	Check printer connections and power switch.
Remove infinity hold first	A method can have an infinity hold segment as the last segment in the method. This message occurs when a user tries to add a segment after one which contains an infinity hold.	Add segments prior to the post-PCR infinity hold.
T_m temperature out of range	T_m out of range.	Check input value and retry.
User name already defined	You entered a user name that already exists.	Do not duplicate user names.
Valid range is	You entered a number out of range. The message include the valid range limits.	Re-enter a value within the parameters of the field.

a. http://www.appliedbiosystems.com/2700

Serious Error Messages

The following table lists error messages that may indicate a serious problem such as hardware malfunction. A description of the problem and recommended action are provided.

<table>
<tr><th>Message</th><th>Description</th><th>Recommended Action</th></tr>
<tr><td>Error 1</td><td>Block shut off by hardware due to thermal runaway.</td><td rowspan="3">Note the error number, and refer to our Web site.[a]</td></tr>
<tr><td>Error 2</td><td>Block thermal runaway</td></tr>
<tr><td>Error 3</td><td>Heated cover shut off by hardware due to thermal runaway.</td></tr>
<tr><td>Error 4</td><td>Heat sink is too hot. Ambient conditions may be too warm.</td><td>Ensure that the fan is running and instrument vents are clear.
Move instrument to well-ventilated location (15–30 °C).
Run rate test diagnostic.
Note the error number, and refer to our Web site.[a]</td></tr>
<tr><td>Error 5</td><td>Heat sink sensor failure</td><td rowspan="3">Note the error number, and refer to our Web site.[a]</td></tr>
<tr><td>Error 6</td><td>Heated cover thermal runaway</td></tr>
<tr><td>Error 7</td><td>Heated cover sensor failure</td></tr>
<tr><td>Error 8</td><td>Setpoint could not be reached
♦ The instrument could not reach a temperature parameter set by the user.
The unit has a Peltier or power amplifier failure.
♦ Ambient conditions may be out of recommended range.</td><td><table><tr><th>If this error occurs...</th><th>Then...</th></tr><tr><td>immediately after a firmware upgrade</td><td>Switch the instrument power off, then on again.</td></tr><tr><td>any other time</td><td>See recommended actions for Error 4.</td></tr></table></td></tr>
<tr><td>Error 9</td><td>Sample block sensor failure</td><td rowspan="10">Note the error number, and refer to our Web site.[a]</td></tr>
<tr><td>Error 10</td><td>Battery RAM version number lost[b]</td></tr>
<tr><td>Error 11</td><td>Bus error</td></tr>
<tr><td>Error 12</td><td>Calibration battery RAM initialized[b]
Instrument may not perform to specification.</td></tr>
<tr><td>Error 13</td><td>System can’t allocate timer</td></tr>
<tr><td>Error 14</td><td>Stack overflow software error</td></tr>
<tr><td>Error 15</td><td>LCD screen timed-out</td></tr>
<tr><td>Error 16</td><td>Preferences battery RAM initialized[b]
User configuration has been reset due to software error.</td></tr>
<tr><td>Error 17</td><td>Invalid pointer system error.</td></tr>
<tr><td>Error 18</td><td>Watchdog timeout software failure.</td></tr>
</table>

a. http://www.appliedbiosystems.com/2700

b. If your instrument has been in storage for more than 3 months, it is possible that the battery has lost its charge but can recover. Contact Applied Biosystems Technical Support.

Troubleshooting Information

Troubleshooting Table

The following table lists the problem, possible causes, and a check and/or remedy for troubleshooting the system 2700.

Problem	Possible Causes	Check and/or Remedy
Control panel not responding	♦ Key stuck in down position. ♦ Keypad failure.	♦ Look for depressed key and free it. ♦ Run keypad diagnostic. Refer to our Web site.[a]
Cooling rate too slow	♦ Ambient temperature is too warm. ♦ Peltier failure.	♦ Move instrument to well-ventilated location (15–30 °C). ♦ Run rate test diagnostic. Refer to our Web site.[a]
Cycling time too long	Peltier failure.	Run cycle test diagnostic.
Displayed temperature does not match specified temperature	Instrument may require calibration.	Run the temperature verification test. Refer to our Web site.[a]
Heated cover not responsive	Heated cover failure.	Refer to our Web site.[a]
Heating rate too slow	Peltier failure.	Run rate test diagnostic. Refer to our Web site.[a]
Instrument can't reach high or low temperature range	♦ Peltier failure. ♦ Ambient temperature too warm.	♦ Run rate test diagnostic. ♦ Run cycle test diagnostic. Refer to our Web site.[a]
Instrument making too much noise	Fan failure.	Check for vent obstructions.
No screen display No response when you turn the instrument on	♦ Fuse blown. ♦ Not connected to power source.	♦ Is power switch ON? ♦ Is power cord connected? ♦ Check fuses.
Printer fails	♦ Incorrect printer configuration. ♦ Incorrect printer cable.	♦ Check printer for baud rate = 9600, no parity, one stop bit, eight data bits. ♦ Purchase Applied Biosystems printer cable.
Whirring fan does not sound	♦ Fuse blown. ♦ Not connected to power source.	♦ Is power switch ON? ♦ Is power cord connected? ♦ Check fuses. Refer to our Web site.[a]

a. http://www.appliedbiosystems.com/2700

Getting Help

A

Overview

About This Appendix

This appendix describes how to get technical help from Applied Biosystems.

Technical Support

Contacting Technical Support

You can contact Applied Biosystems for technical support by telephone or fax, by e-mail, or through the Internet. You can order Applied Biosystems user documents, MSDSs, certificates of analysis, and other related documents 24 hours a day. In addition, you can download documents in PDF format from the Applied Biosystems Web site (please see the section "To Obtain Documents on Demand" following the telephone information below).

To Contact Technical Support by E-Mail

Contact technical support by e-mail for help in the following product areas:

Product Area	E-mail address
Sequence Detection Systems and PCR	pcrlab@appliedbiosystems.com

Hours for Telephone Technical Support

In the United States and Canada, technical support is available at the following times:

Product	Hours
Chemiluminescence	8:30 a.m. to 5:30 p.m. Eastern Time
Framingham support	8:00 a.m. to 6:00 p.m. Eastern Time
All Other Products	5:30 a.m. to 5:00 p.m. Pacific Time

To Contact Technical Support by Telephone or Fax

In North America

To contact Applied Biosystems Technical Support, use the telephone or fax numbers given below. (To open a service call for other support needs, or in case of an emergency, dial **1-800-831-6844** and press **1**.)

Product or Product Area	Telephone Dial...	Fax Dial...
PCR and Sequence Detection	**1-800-762-4001**, then press **1** for PCR, **2** for the 7700, 7900 or 5700, **6** for the 6700 or dial **1-800-831-6844**, then press **5**	**1-240-453-4613**

Outside North America

Region	Telephone Dial...	Fax Dial...
Africa and the Middle East		
Africa (English Speaking) and West Asia (Fairlands, South Africa)	**27 11 478 0411**	**27 11 478 0349**
Africa (French Speaking; Courtaboeuf Cedex, France)	**33 1 69 59 85 11**	**33 1 69 59 85 00**
South Africa (Johannesburg)	**27 11 478 0411**	**27 11 478 0349**
Middle Eastern Countries and North Africa (Monza, Italia)	**39 (0)39 8389 481**	**39 (0)39 8389 493**

Region	Telephone Dial...	Fax Dial...
Eastern Asia, China, Oceania		
Australia (Scoresby, Victoria)	**61 3 9730 8600**	**61 3 9730 8799**
China (Beijing)	**86 10 64106608** or **86 800 8100497**	**86 10 64106617**
Hong Kong	**852 2756 6928**	**852 2756 6968**
India (New Delhi)	**91 11 653 3743/3744**	**91 11 653 3138**
Korea (Seoul)	**82 2 593 6470/6471**	**82 2 593 6472**
Malaysia (Petaling Jaya)	**60 3 79588268**	**603 79549043**
Singapore	**65 896 2168**	**65 896 2147**
Taiwan (Taipei Hsien)	**886 2 2358 2838**	**886 2 2358 2839**
Thailand (Bangkok)	**66 2 719 6405**	**66 2 319 9788**
Europe		
Austria (Wien)	**43 (0)1 867 35 75 0**	**43 (0)1 867 35 75 11**
Belgium	**32 (0)2 532 4484**	**32 (0)2 582 1886**
Czech Republic and Slovakia (Praha)	**420 2 35365189**	**420 2 35364314**
Denmark (Naerum)	**45 45 58 60 00**	**45 45 58 60 01**
Finland (Espoo)	**358 (0)9 251 24 250**	**358 (0)9 251 24 243**
France (Paris)	**33 (0)1 69 59 85 85**	**33 (0)1 69 59 85 00**
Germany (Weiterstadt)	**49 (0) 6150 101 0**	**49 (0) 6150 101 101**
Hungary (Budapest)	**36 (0)1 270 8398**	**36 (0)1 270 8288**
Italy (Milano)	**39 (0)39 83891**	**39 (0)39 838 9492**
Norway (Oslo)	**47 23 12 06 05**	**47 23 12 05 75**
Poland, Lithuania, Latvia, and Estonia (Warszawa)	**48 (22) 866 40 10**	**48 (22) 866 40 20**
Portugal (Lisboa)	**351 (0)22 605 33 14**	**351 (0)22 605 33 15**
Russia (Moskva)	**7 502 935 8888**	**7 502 564 8787**
South East Europe (Zagreb, Croatia)	**385 1 34 91 927/838**	**385 1 34 91 840**
Spain (Tres Cantos)	**34 (0)91 806 1210**	**34 (0)91 806 1206**
Sweden (Stockholm)	**46 (0)8 619 4400**	**46 (0)8 619 4401**
Switzerland (Rotkreuz)	**41 (0)41 799 7777**	**41 (0)41 790 0676**
The Netherlands (Nieuwerkerk a/d IJssel)	**31 (0)180 392400**	**31 (0)180 392409** or **31 (0)180 392499**
United Kingdom (Warrington, Cheshire)	**44 (0)1925 825650**	**44 (0)1925 282502**
All other countries not listed (Warrington, UK)	**44 (0)1925 282481**	**44 (0)1925 282509**
Japan		
Japan (Hacchobori, Chuo-Ku, Tokyo)	**81 20 477392** (Toll free) or **81 3 5566 6230**	**81 20 477120** (Toll free) or **81 3 5566 6507**

Region	Telephone Dial...	Fax Dial...
Latin America		
Caribbean countries, Mexico, and Central America	**52 55 35 3610**	**52 55 66 2308**
Brazil	**0 800 704 9004** or **55 11 5070 9654**	**55 11 5070 9694/95**
Argentina	**800 666 0096**	**55 11 5070 9694/95**
Chile	**1230 020 9102**	**55 11 5070 9694/95**
Uruguay	**0004 055 654**	**55 11 5070 9694/95**

To Reach Technical Support Through the Internet

We strongly encourage you to visit our Web site for answers to frequently asked questions and for more information about our products. You can also order technical documents or an index of available documents and have them faxed or e-mailed to you through our site. The Applied Biosystems Web site address is

http://www.appliedbiosystems.com/techsupp

To submit technical questions from North America or Europe:

Step	Action
1	Access the Applied Biosystems Technical Support Web site.
2	Under the **Troubleshooting** heading, click **Support Request Forms,** then select the relevant support region for the product area of interest.
3	In the **Personal Assistance** form, enter the requested information and your question, then click **Ask Us RIGHT NOW**.
4	In the **Customer Information** form, enter the requested information and your question, then click **Ask Us RIGHT NOW**. Within 24 to 48 hours, you will receive an e-mail reply to your question from an Applied Biosystems technical expert.

To Obtain Documents on Demand

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by phone for fax delivery	a. From the U.S. or Canada, call **1-800-487-6809,** or from outside the U.S. and Canada, call **1-858-712-0317**. b. Follow the voice instructions to order the documents you want. **Note** There is a limit of five documents per request.

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The Applied Biosystems Training web site at **www.appliedbiosystems.com/techsupp/training.html** provides course descriptions, schedules, and other training-related information.

Specifications

B

Overview

About This Appendix

This appendix provides specifications for the GeneAmp® PCR System 2700.

System Specifications

Dimensions

The table below lists the footprint and the weight of the system 2700.

Footprint	
Note You must provide sufficient space around the instrument for unrestricted air circulation.	
Height	21.5 cm (8.5 in)
Width	21 cm (8.25 in)
Depth	35 cm (14 in)
Weight	
Instrument	5.9 kg (13 lbs)

Power Configurations

There is one version of the system 2700. The power requirements of the instrument under various power configurations are:

VAC ~100/120	8 AMP T (5x20 mm) or 8 AMP slow blow (3 AB)	50/60 Hz Use 250 V fuses Max Power 420 VA
VAC ~220/230/240	8 AMP T (5x20 mm)	

Control Panel Specifications

Display Screen

The display screen is a 7 x 40 character display with a 60 x 240 pixel resolution graphics mode.

Keys

The instrument control panel consists of a display screen and 22 keys:

- 5 function keys
- 4 arrow keys
- Stop key
- Enter key
- 10-number keypad
- CE key

Sample Temperature Information

Temperature

The table below lists sample temperature information.

Note Sample temperatures are displayed in degrees Celsius to the nearest 0.1 °C.

Sample Temperature Range	4.0 to 99.9 °C.
Temperature Calibration	Traceable to National Institute of Standards and Technology (NIST).

Printer Specifications

Serial Interface Board Specifications

The system 2700 can use any printer with a serial (RS-232C) interface board with the following parameters.

Baud Rate	9600
Parity	NONE
Data Bits	8
Stop Bits	1

Cable Part Number

Connect the printer to the instrument port with printer cable part number N805-1326.

Supplied Methods

C

Overview

About This Appendix

This appendix describes precoded methods supplied with your instrument.

About the Methods

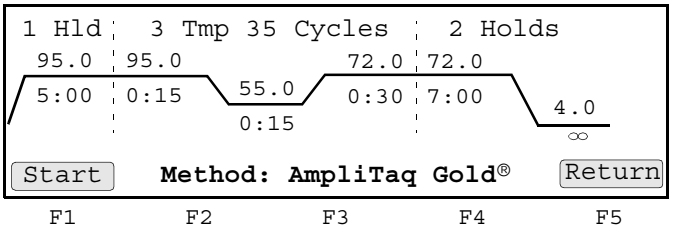
Five Precoded Methods

The GeneAmp® PCR System 2700 supplies you with five precoded methods stored under the user name <<ab>>:

- AmpliTaq Gold®
- BigDye™ Terminator
- General PCR
- Time Release PCR
- Touchdown PCR

AmpliTaq Gold

The AmpliTaq Gold protocol specifies a 5-minute pre-PCR heat step, required for the activation of AmpliTaq Gold® DNA Polymerase. This additional step provides seamless “hot start” PCR and replaces labor intensive methods such as manual hot start or wax bead-mediated hot start techniques.

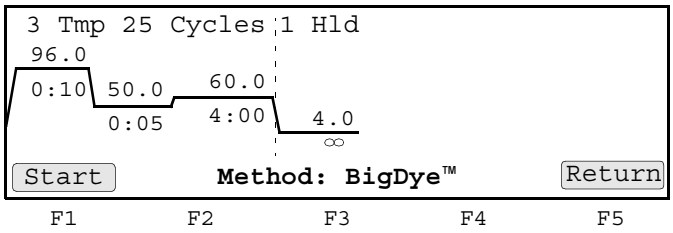


Utilizing hot start techniques helps to minimize the formation of primer-dimers or non-specific products, thus increasing specificity and sensitivity of PCR.

You can find further information on AmpliTaq Gold DNA Polymerase in the product insert (P/N N808-0241) or at the Applied Biosystems Web site.

BigDye Terminator

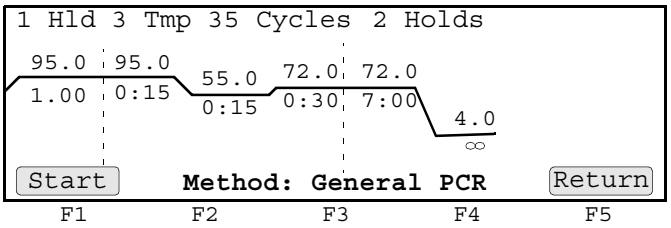
The BigDye™ Terminator protocol is used for cycle sequencing. It consists of 3-temperature PCR for 25 cycles followed by an infinite hold at 4 °C.



The reagents used include the sequencing enzyme AmpliTaq® DNA Polymerase, FS, and fluorescent labeled dye terminators. Four different fluorescent dyes, one for each base, are incorporated into extension products. These products can then by purified. Subsequently, electrophoresis and data analysis can be performed on them. This process is further described in the protocol *ABI PRISM® BigDye™ Terminator Cycle Sequencing Ready Reaction Kits* (P/N 4303237).

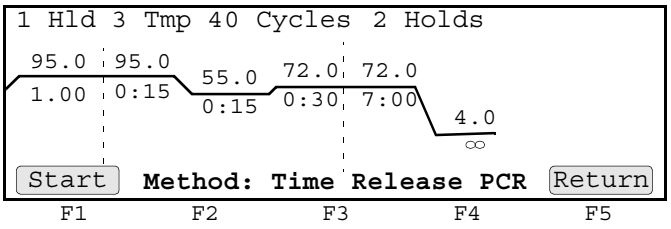
General PCR

The General PCR method is a basic one and can be easily modified with both pre- and post-PCR holds.



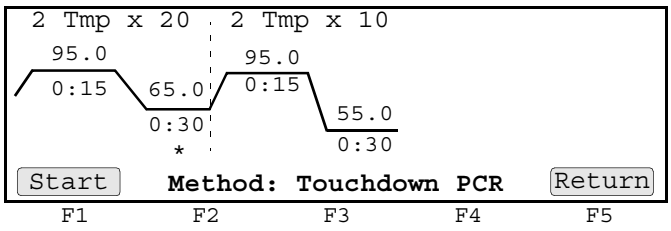
Time Release PCR

The Time Release PCR method is designed for use with AmpliTaq Gold DNA Polymerase. The enzyme is activated more slowly than with the AmpliTaq Gold method. Here the pre-PCR hold is only 1 minute, and the number of cycles is increased to 40.



Touchdown PCR

When the optimal annealing temperature is unknown, one strategy, Touchdown PCR, incrementally decreases the annealing temperature in early cycles in order to maximize the yield of specific products.



This supplied method has an initial annealing temperature (65 °C) that incrementally decreases by an additional 0.5 °C in each of the first 20 cycles, followed by 10 cycles at 55 °C.

Screen Flowcharts

D

Overview

About This Appendix

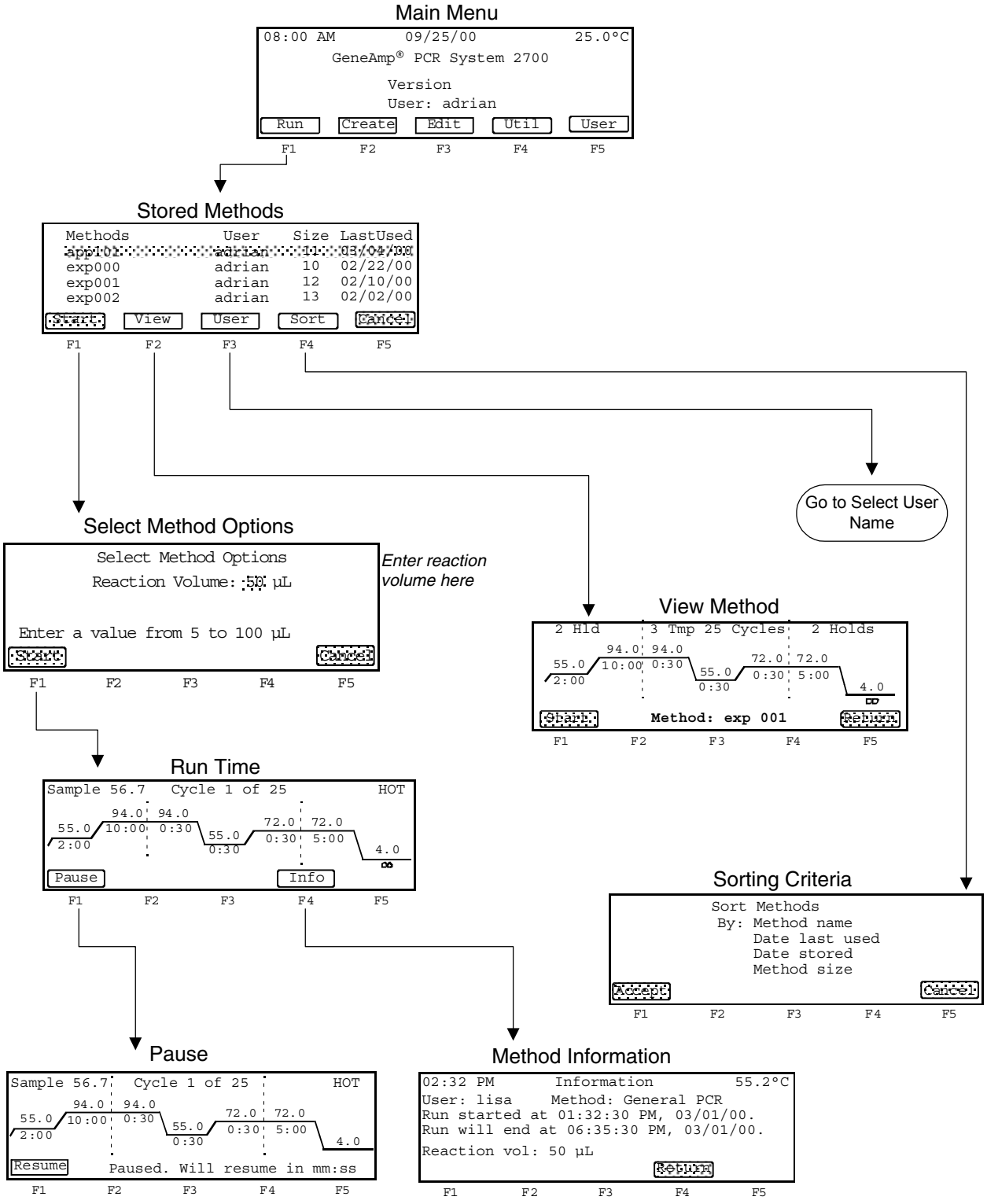
This appendix provides flowcharts showing screen flows for various functions you might want to use. These charts provide an overview of a procedure.

In This Appendix

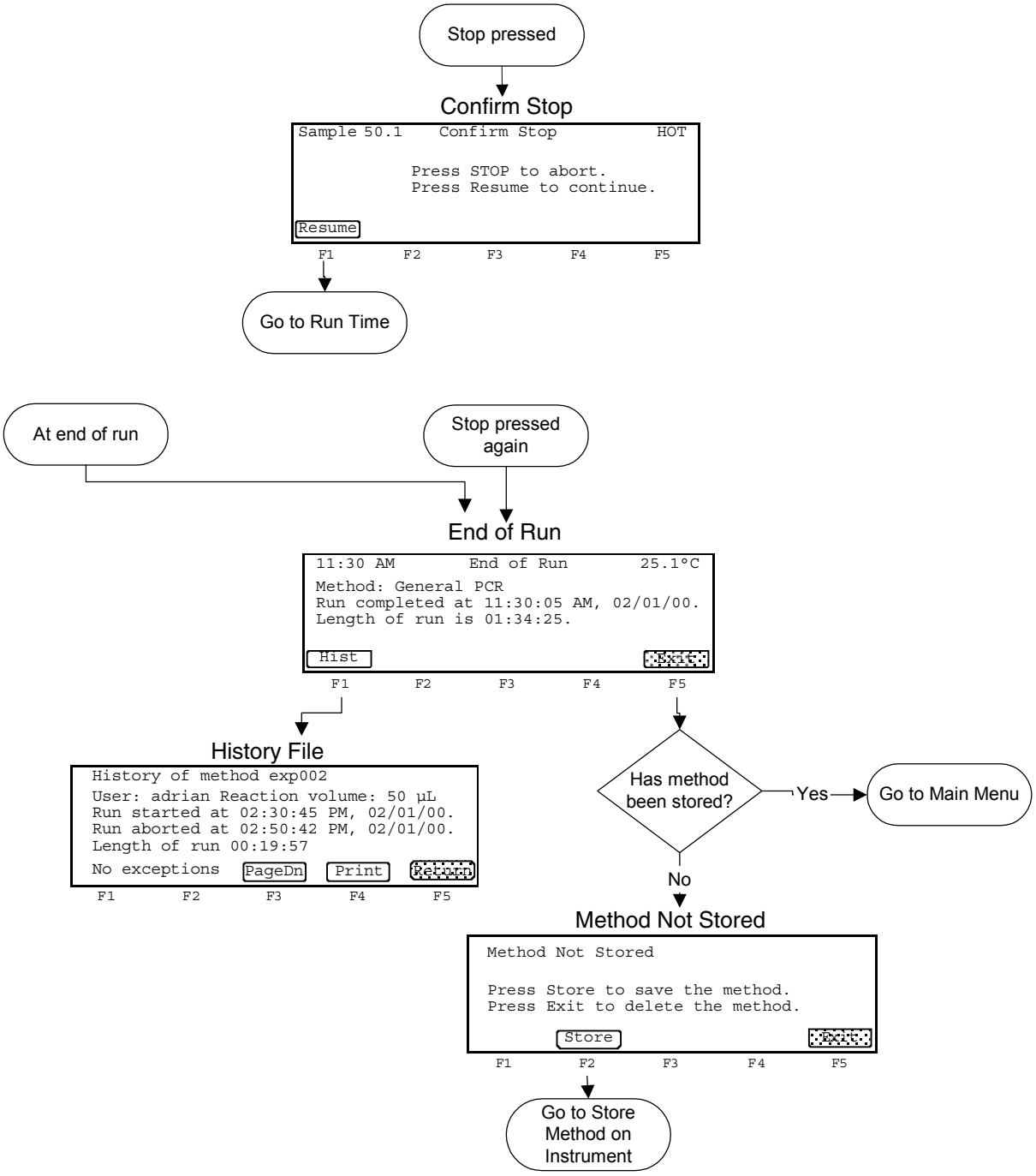
Flowcharts are included for the following topics:

Topic	See Page
Run	D-2
Stop or End of Run	D-3
Create/Edit	D-4
User	D-5
Utilities	D-6
Diagnostics	D-7
Upgrade	D-8

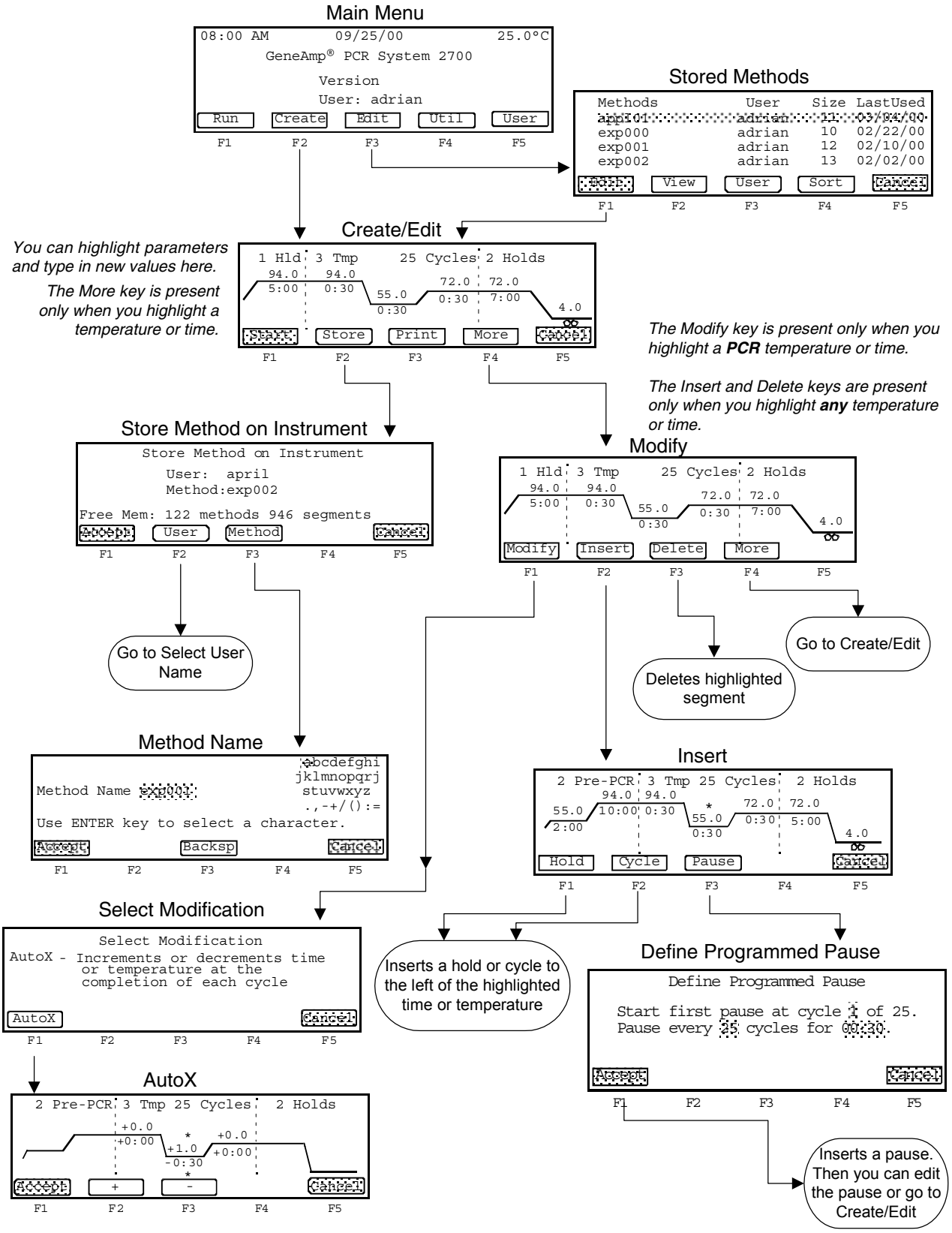
Run


Main Menu
08:00 AM 09/25/00 25.0°C
GeneAmp® PCR System 2700
Version
User: adrian
Run Create Edit Util User
F1 F2 F3 F4 F5
Stored Methods
Methods User Size LastUsed
app101 adrian 11 03/04/00
exp000 adrian 10 02/22/00
exp001 adrian 12 02/10/00
exp002 adrian 13 02/02/00
Start View User Sort Cancel
F1 F2 F3 F4 F5
Go to Select User Name
Select Method Options
Select Method Options
Reaction Volume: 50 µL
Enter a value from 5 to 100 µL
Start Cancel
F1 F2 F3 F4 F5
Enter reaction volume here
View Method
2 Hld 3 Tmp 25 Cycles 2 Holds
55.0 2:00 94.0 10:00 94.0 0:30 55.0 0:30 72.0 0:30 72.0 5:00 4.0 ∞
Start Method: exp 001 Reburn
F1 F2 F3 F4 F5
Run Time
Sample 56.7 Cycle 1 of 25 HOT
55.0 2:00 94.0 10:00 94.0 0:30 55.0 0:30 72.0 0:30 72.0 5:00 4.0 ∞
Pause Info
F1 F2 F3 F4 F5
Sorting Criteria
Sort Methods
By: Method name
Date last used
Date stored
Method size
Accept Cancel
F1 F2 F3 F4 F5
Pause
Sample 56.7 Cycle 1 of 25 HOT
55.0 2:00 94.0 10:00 94.0 0:30 55.0 0:30 72.0 0:30 72.0 5:00 4.0
Resume Paused. Will resume in mm:ss
F1 F2 F3 F4 F5
Method Information
02:32 PM Information 55.2°C
User: lisa Method: General PCR
Run started at 01:32:30 PM, 03/01/00.
Run will end at 06:35:30 PM, 03/01/00.
Reaction vol: 50 µL
Return
F1 F2 F3 F4 F5

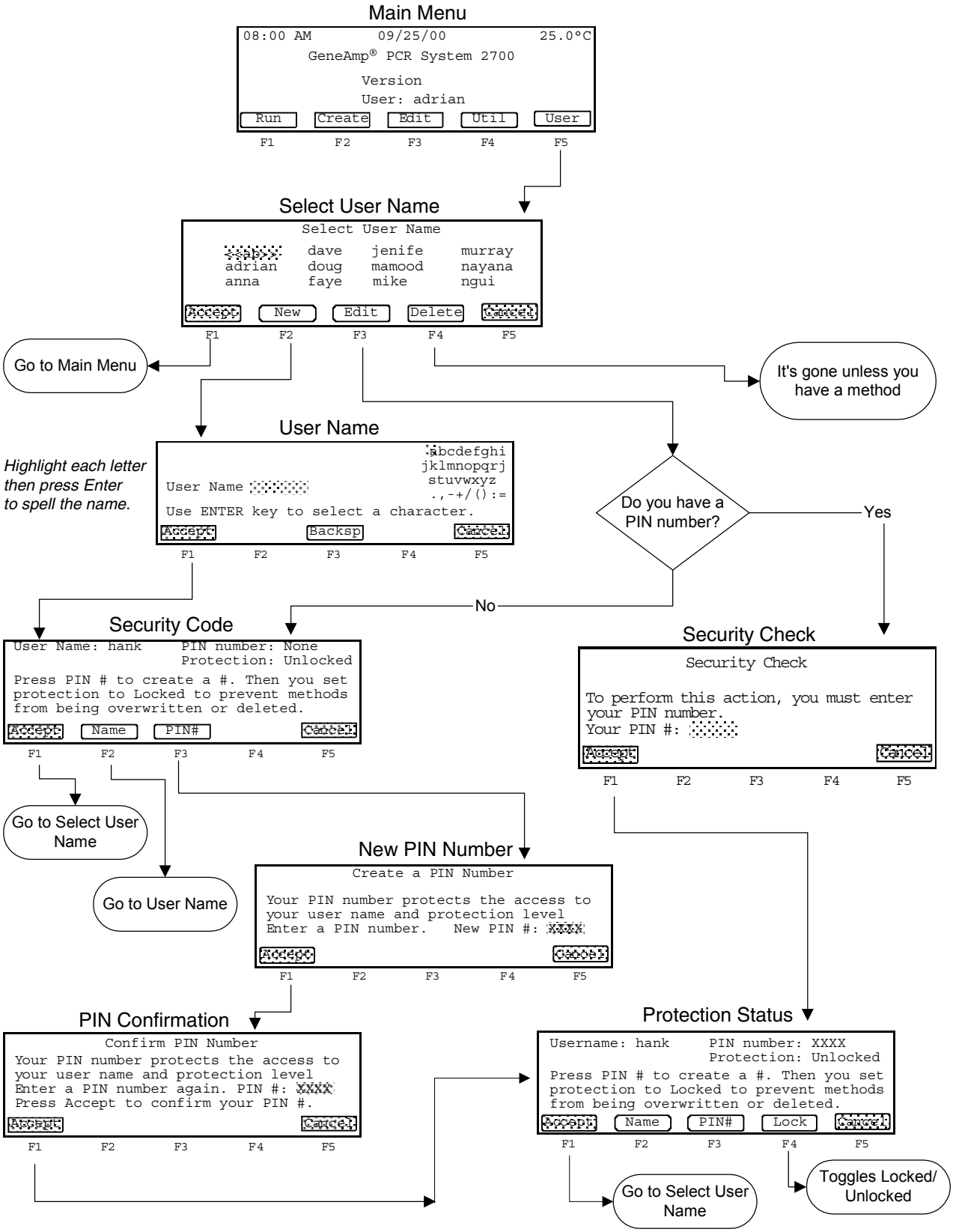
Stop or End of Run



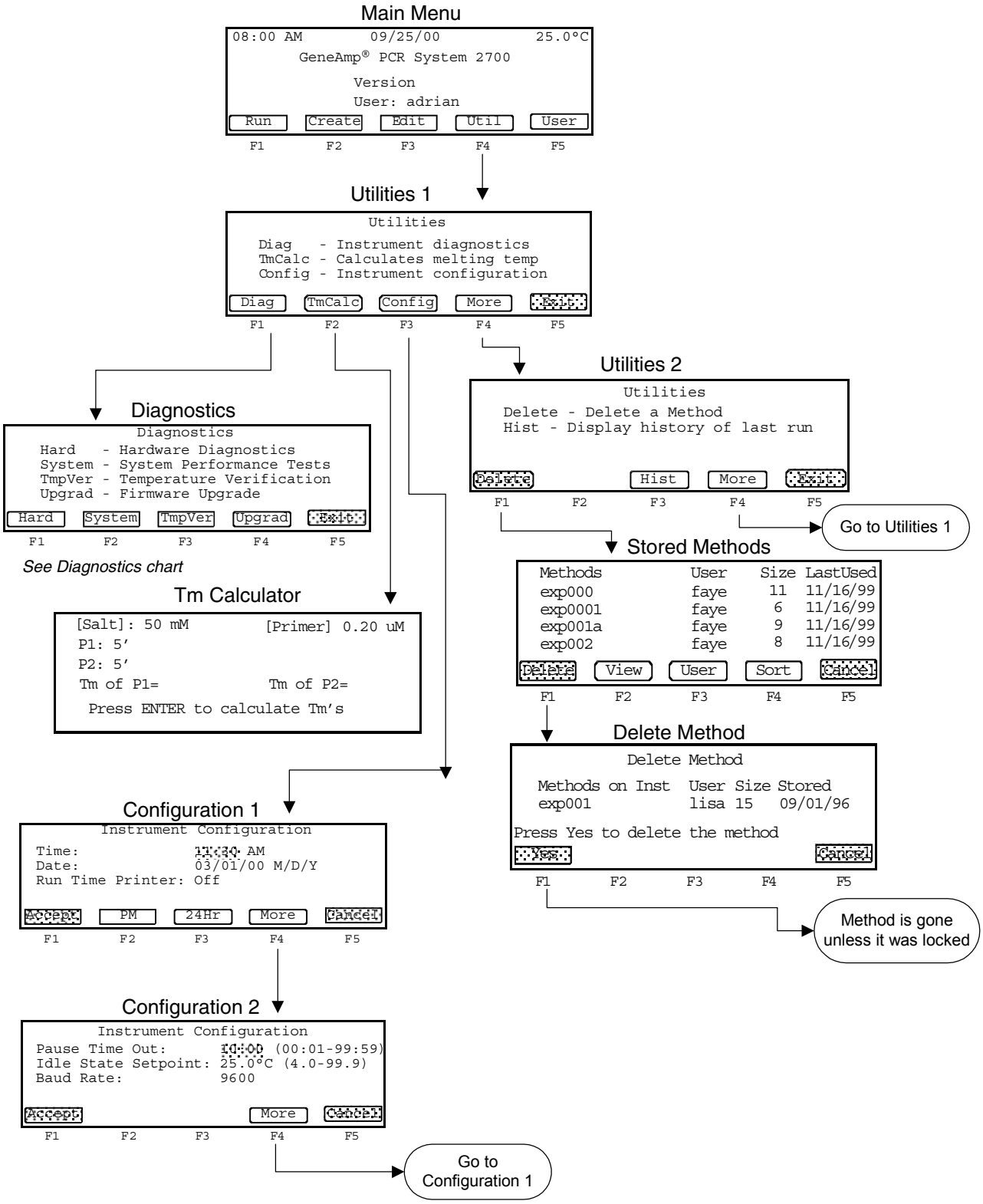
Create/Edit


Main Menu
08:00 AM 09/25/00 25.0°C
GeneAmp® PCR System 2700
Version
User: adrian
Run Create Edit Util User
F1 F2 F3 F4 F5
Stored Methods
Methods User Size LastUsed
appl01 adrian 11 03/04/00
exp000 adrian 10 02/22/00
exp001 adrian 12 02/10/00
exp002 adrian 13 02/02/00
Edit View User Sort Cancel
F1 F2 F3 F4 F5
Create/Edit
You can highlight parameters and type in new values here.
The More key is present only when you highlight a temperature or time.
1 Hld 3 Tmp 25 Cycles 2 Holds
94.0 94.0 72.0 72.0
5:00 0:30 55.0 0:30 7:00 4.0
0:30
Start Store Print More Cancel
F1 F2 F3 F4 F5
The Modify key is present only when you highlight a PCR temperature or time.
The Insert and Delete keys are present only when you highlight any temperature or time.
Store Method on Instrument
Store Method on Instrument
User: april
Method:exp002
Free Mem: 122 methods 946 segments
Accept User Method Cancel
F1 F2 F3 F4 F5
Modify
1 Hld 3 Tmp 25 Cycles 2 Holds
94.0 94.0 72.0 72.0
5:00 0:30 55.0 0:30 7:00 4.0
0:30
Modify Insert Delete More
F1 F2 F3 F4 F5
Go to Select User Name
Deletes highlighted segment
Go to Create/Edit
Method Name
Method Name exp001
abcdefghi
jklmnopqrj
stuvwxyz
.,-+/():=
Use ENTER key to select a character.
Accept Backsp Cancel
F1 F2 F3 F4 F5
Insert
2 Pre-PCR 3 Tmp 25 Cycles 2 Holds
94.0 94.0 72.0 72.0
55.0 10:00 0:30 * 55.0 0:30 5:00 4.0
2:00 0:30
Hold Cycle Pause Cancel
F1 F2 F3 F4 F5
Select Modification
Select Modification
AutoX - Increments or decrements time or temperature at the completion of each cycle
AutoX Cancel
F1 F2 F3 F4 F5
Inserts a hold or cycle to the left of the highlighted time or temperature
Define Programmed Pause
Define Programmed Pause
Start first pause at cycle 1 of 25.
Pause every 25 cycles for 00:30.
Accept Cancel
F1 F2 F3 F4 F5
Inserts a pause. Then you can edit the pause or go to Create/Edit
AutoX
2 Pre-PCR 3 Tmp 25 Cycles 2 Holds
+0.0 * +0.0
+0:00 +1.0 +0:00
-0:30
*
Accept + - Cancel
F1 F2 F3 F4 F5

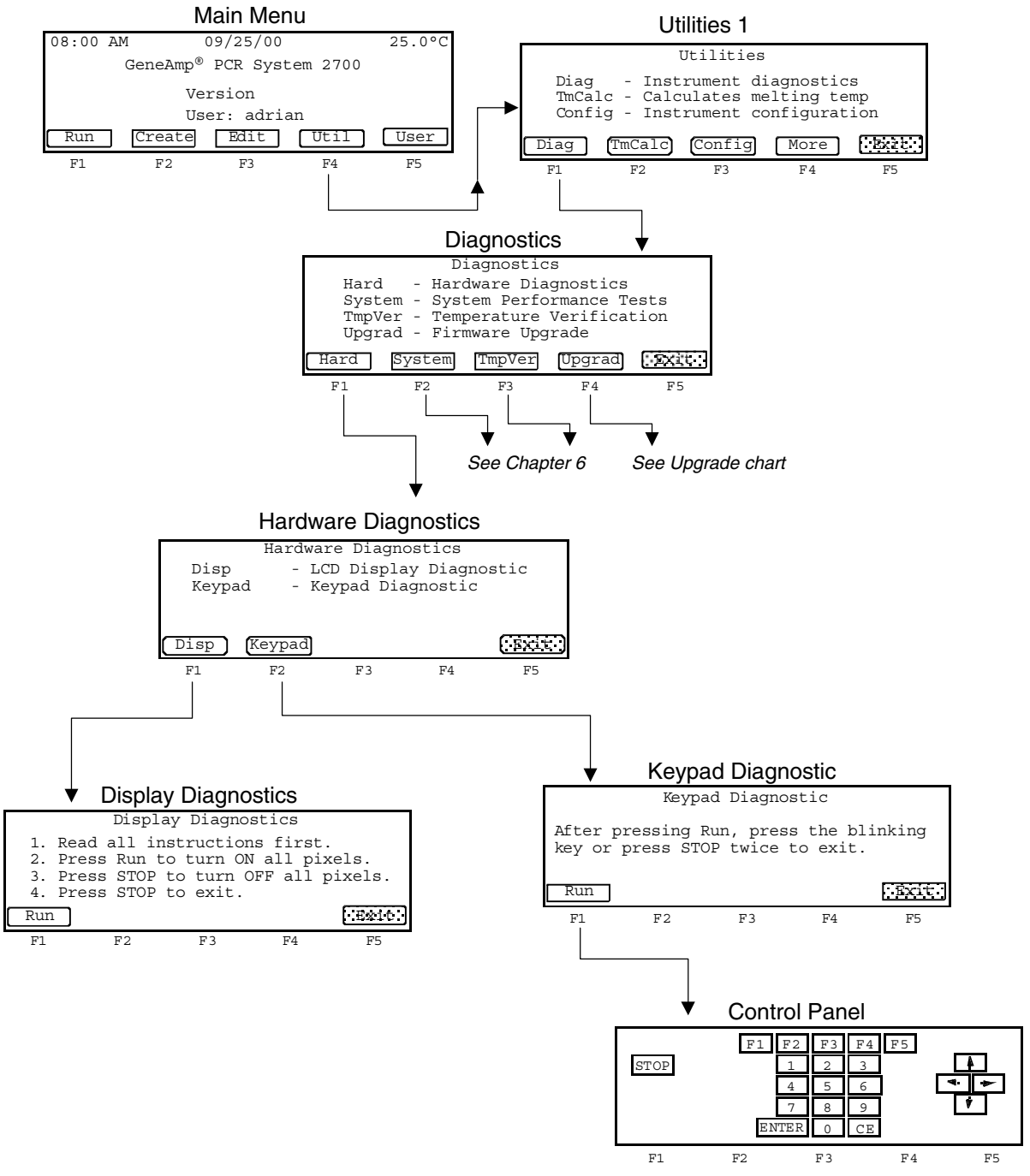
User


Main Menu
08:00 AM 09/25/00 25.0°C
GeneAmp® PCR System 2700
Version
User: adrian
Run
Create
Edit
Util
User
F1 F2 F3 F4 F5
Select User Name
Select User Name
<<all>> dave jenife murray
adrian doug mamood nayana
anna faye mike ngui
Accept
New
Edit
Delete
Cancel
F1 F2 F3 F4 F5
Go to Main Menu
It's gone unless you have a method
User Name
Highlight each letter then press Enter to spell the name.
abcdefghi
jklmnopqrj
stuvwxyz
.,-+/():=
User Name
Use ENTER key to select a character.
Accept
Backsp
Cancel
F1 F2 F3 F4 F5
Do you have a PIN number?
Yes
No
Security Code
User Name: hank PIN number: None
Protection: Unlocked
Press PIN # to create a #. Then you set protection to Locked to prevent methods from being overwritten or deleted.
Accept
Name
PIN#
Cancel
F1 F2 F3 F4 F5
Security Check
Security Check
To perform this action, you must enter your PIN number.
Your PIN #:
Accept
Cancel
F1 F2 F3 F4 F5
Go to Select User Name
Go to User Name
New PIN Number
Create a PIN Number
Your PIN number protects the access to your user name and protection level
Enter a PIN number. New PIN #: XXXX
Accept
Cancel
F1 F2 F3 F4 F5
PIN Confirmation
Confirm PIN Number
Your PIN number protects the access to your user name and protection level
Enter a PIN number again. PIN #: XXXX
Press Accept to confirm your PIN #.
Accept
Cancel
F1 F2 F3 F4 F5
Protection Status
Username: hank PIN number: XXXX
Protection: Unlocked
Press PIN # to create a #. Then you set protection to Locked to prevent methods from being overwritten or deleted.
Accept
Name
PIN#
Lock
Cancel
F1 F2 F3 F4 F5
Go to Select User Name
Toggles Locked/ Unlocked

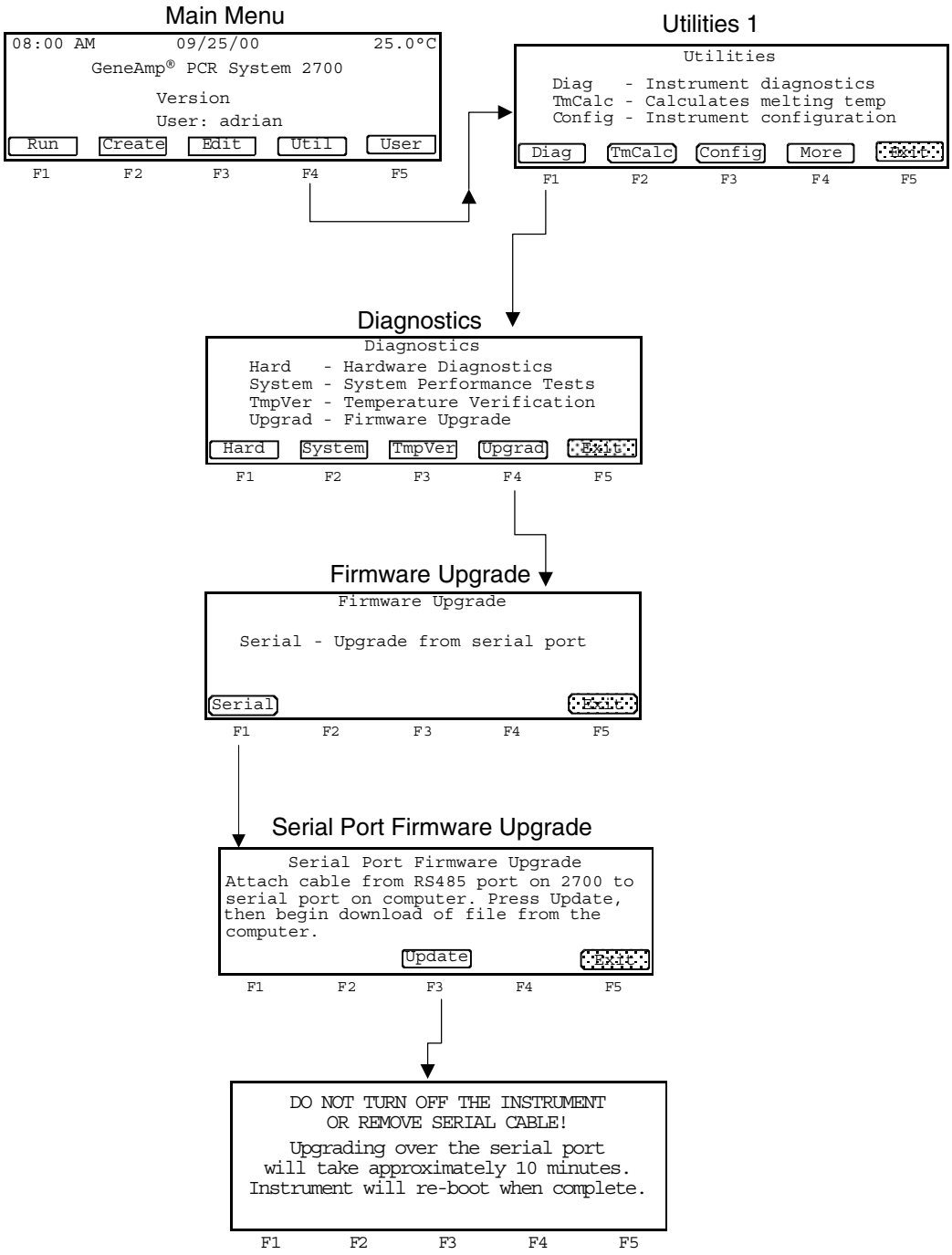
Utilities


Main Menu
08:00 AM 09/25/00 25.0°C
GeneAmp® PCR System 2700
Version
User: adrian
Run Create Edit Util User
F1 F2 F3 F4 F5
Utilities 1
Utilities
Diag - Instrument diagnostics
TmCalc - Calculates melting temp
Config - Instrument configuration
Diag TmCalc Config More Exit
F1 F2 F3 F4 F5
Diagnostics
Diagnostics
Hard - Hardware Diagnostics
System - System Performance Tests
TmpVer - Temperature Verification
Upgrad - Firmware Upgrade
Hard System TmpVer Upgrad Exit
F1 F2 F3 F4 F5
See Diagnostics chart
Tm Calculator
[Salt]: 50 mM [Primer] 0.20 uM
P1: 5′
P2: 5′
Tm of P1= Tm of P2=
Press ENTER to calculate Tm's
Utilities 2
Utilities
Delete - Delete a Method
Hist - Display history of last run
Delete Hist More Exit
F1 F2 F3 F4 F5
Go to Utilities 1
Stored Methods
Methods User Size LastUsed
exp000 faye 11 11/16/99
exp0001 faye 6 11/16/99
exp001a faye 9 11/16/99
exp002 faye 8 11/16/99
Delete View User Sort Cancel
F1 F2 F3 F4 F5
Delete Method
Delete Method
Methods on Inst User Size Stored
exp001 lisa 15 09/01/96
Press Yes to delete the method
Yes Cancel
F1 F2 F3 F4 F5
Method is gone unless it was locked
Configuration 1
Instrument Configuration
Time: 11:30 AM
Date: 03/01/00 M/D/Y
Run Time Printer: Off
Accept PM 24Hr More Cancel
F1 F2 F3 F4 F5
Configuration 2
Instrument Configuration
Pause Time Out: 10:00 (00:01-99:59)
Idle State Setpoint: 25.0°C (4.0-99.9)
Baud Rate: 9600
Accept More Cancel
F1 F2 F3 F4 F5
Go to Configuration 1

Diagnostics



Upgrade


Main Menu
08:00 AM 09/25/00 25.0°C
GeneAmp® PCR System 2700
Version
User: adrian
Run
Create
Edit
Util
User
F1 F2 F3 F4 F5
Utilities 1
Utilities
Diag - Instrument diagnostics
TmCalc - Calculates melting temp
Config - Instrument configuration
Diag
TmCalc
Config
More
Exit
F1 F2 F3 F4 F5
Diagnostics
Diagnostics
Hard - Hardware Diagnostics
System - System Performance Tests
TmpVer - Temperature Verification
Upgrad - Firmware Upgrade
Hard
System
TmpVer
Upgrad
Exit
F1 F2 F3 F4 F5
Firmware Upgrade
Firmware Upgrade
Serial - Upgrade from serial port
Serial
Exit
F1 F2 F3 F4 F5
Serial Port Firmware Upgrade
Serial Port Firmware Upgrade
Attach cable from RS485 port on 2700 to serial port on computer. Press Update, then begin download of file from the computer.
Update
Exit
F1 F2 F3 F4 F5
DO NOT TURN OFF THE INSTRUMENT
OR REMOVE SERIAL CABLE!
Upgrading over the serial port
will take approximately 10 minutes.
Instrument will re-boot when complete.
F1 F2 F3 F4 F5

Index

A

AmpliTaq Gold, about supplied method C-2
AutoX function 5-16 to 5-17

B

baud rate 6-3
BigDye Terminator, about supplied method C-3

C

calibration verification test 6-9
CE key 2-4
chemical hazard warning 1-10
chemical waste hazard warning 1-10
cleaning instrument 7-2 to 7-3
configuring instrument 6-2 to 6-3
control panel 2-4
create/edit
  flowchart of screens D-4
  screen 5-6
  screen, described 2-6
customer support. *See* technical support A-2
cycle test 6-11 to 6-12
cycle, inserting 5-12 to 5-13

D

date, configuring 6-3
diagnostics
  flowchart of screens D-7
  hardware 6-7 to 6-8
dimensions B-2
display
  overview 2-4
  specifications B-2
  testing 6-7
disposables 4-2 to 4-4
Documents on Demand A-4

E

electrical safety 1-3 to 1-8
electrical shock hazard 1-7
e-mail, address for technical support A-2
end of run
  flowchart of screens D-3
  screen 4-13
enter key 2-4
environment 1-9
error messages 8-3 to 8-5

F

features 2-5, 3-10
field, selecting 2-4
fire hazard 1-8
firmware, upgrading 6-4
flowcharts D-1 to D-8
function keys 2-4
fuses
  precautions about 1-8
  replacing 7-4 to 7-5

G

GeneAmp PCR System 2700
  overview 2-2 to 2-3
General PCR, about supplied method C-3
grounding 1-8

H

hardware diagnostics 6-7 to 6-8
hazards and warnings 1-3 to 1-12
heated cover, cleaning 7-3
help. *See* technical support A-2
history file 4-11 to 4-12
hold
  deleting 5-11 to 5-12
  inserting 5-10 to 5-11
humidity 1-9

I

idle state setpoint 6-3
Internet address
  Applied Biosystems 6-4
  customer training information A-5
  Documents on Demand A-4

K

keypad 2-4
  testing 6-8

L

labels, safety 1-6
laboratory environmental requirements 1-9

M

main menu 2-5
maintenance, routine 1-6, 7-1 to 7-3
melting temperature 6-6
method
  creating 3-5 to 3-6, 5-6 to 5-8
  defined 2-6, 5-6
  deleting 5-22 to 5-23
  editing 3-7, 5-9
  locked 5-2 to 5-4
  printing 5-22
  protecting 3-10, 5-2 to 5-4
  searching for 5-21

selecting 5-19
sorting 5-20 to 5-21
supplied C-2 to C-4
viewing parameters 5-20
method not stored screen 4-13
MicroAmp disposables 4-2 to 4-4
MSDSs 1-11

N

numbers, entering 2-4

O

operating precautions 1-9

P

pause time out 6-3
pause, programmed
deleting 5-16
editing 5-15
inserting 5-14 to 5-15
PCR segment 2-6
PIN number 5-2 to 5-5
pollution 1-9
post-PCR
parameters 5-8
segment 2-6
power failure 8-2
power on 3-2
precautions, operating 1-9
printer
connecting to 6-5
run time 6-3

R

rate test 6-10 to 6-11
reaction tubes 4-2 to 4-4
restart function 8-2
run 4-1 to 4-13
flowchart of screens D-2
history of 4-11 to 4-12
pausing 4-9
starting 3-8 to 3-9, 4-7 to 4-8
stopping 3-8 to 3-9, 4-10

S

safety 1-1 to 1-12
sample block, cleaning 7-2 to 7-3
sample tubes 4-2 to 4-4
samples
loading 4-5 to 4-6
removing 4-6
specifications B-2 to B-3
starting 3-1 to 3-11
stop key 2-4
stop, flowchart of screens D-3
symbols, safety 1-3 to 1-4
system 2700
functions 2-5
overview 2-2 to 2-3, 3-10 to 3-11

T

technical support A-2 to A-5
e-mail address A-2
Internet address A-4
regional sales offices A-2 to A-4
telephone/fax (North America) A-2
temperature
control 5-16 to 5-17
idle state setpoint 6-3
melting, calculating 6-6
operating precautions 1-9
specifications B-3
verification test 6-9
testing, electrical safety 1-4
Time Release PCR, about supplied method C-3
time, configuring 6-3
Tm calculator 6-6
Touchdown PCR, about supplied method C-4
training
obtaining information A-5
troubleshooting 8-1 to 8-6

U

upgrade, flowshart of screens D-8
user name
adding 3-3 to 3-4, 5-2 to 5-4
changing 5-4 to 5-5
deleting 5-5
flowchart of screens D-5
utilities
flowchart of screens D-6
procedures 6-1 to 6-12

W

warning
chemical hazard 1-10
chemical waste hazard 1-10
waste disposal 1-12
WWW address
Applied Biosystems 6-4, A-4
Documents on Demand A-4

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